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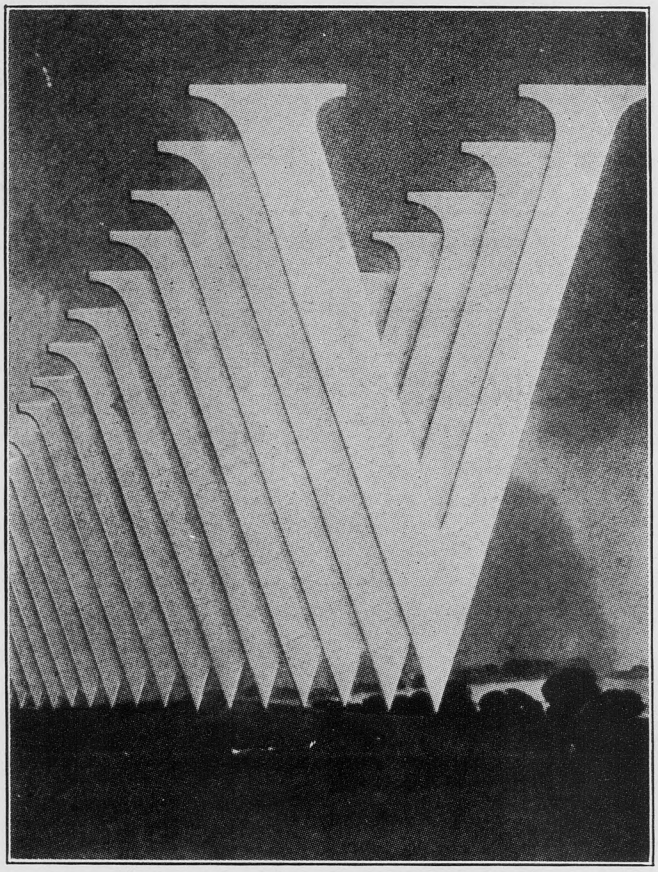
# THE 1943 MARYLAND POULTRY YEARBOOK



*Increased egg and poultry meat production is a very important contribution to Victory*

Published by

**The Maryland State Poultry Council**

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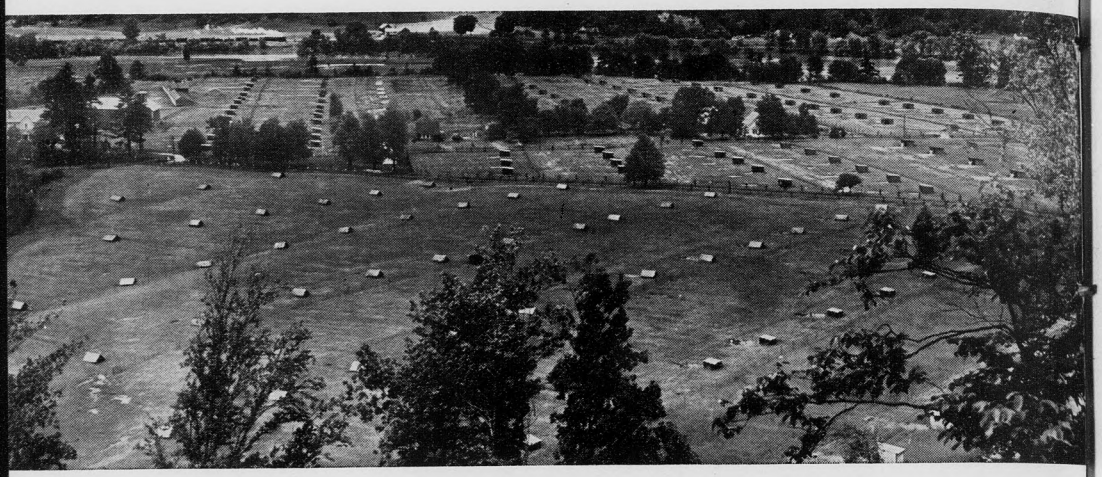
# HUBBARD'S NEW HAMPSHIRES



# ON THE GROWING RANGE

## Where Balanced Breeding Produces Chicks that Live - Grow Fast - Produce

Two generations of Hubbards have contributed their time and energy in building this profit-bred strain — Hubbard's New Hampshires. It has been accomplished through ceaseless trapnesting, pedigree breeding and progeny testing —through an 8-point balanced breeding program — through good management and careful selection year after year.

**BALANCED BREEDING IMPORTANT**

Non-profitable characteristics have been bred out—money-making features bred in. At no time has there been an attempt to build one quality at the expense of another. As a result Hubbard chicks inherit generations of proved blood. They are strong, big-bodied, officially Pullorum passed. They live, grow fast, mature early, become excellent layers and have the stamina to keep on laying.

**BROILER PRODUCTION**

For more broiler profits choose Hubbard's Cross Bred New Hampshire Rocks. Controlled breeding makes these big-bodied chicks live, feather early, grow rapidly, and develop into heavy-meated, solid broilers. Weekly hatches.

**FREE CATALOG**

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# Hubbard Farms

## WALPOLE - NEW HAMPSHIRE

**& Lancaster, Pennsylvania**

# The 1943 MARYLAND *POULTRY* YEARBOOK

Published by

**The Maryland State Poultry Council**

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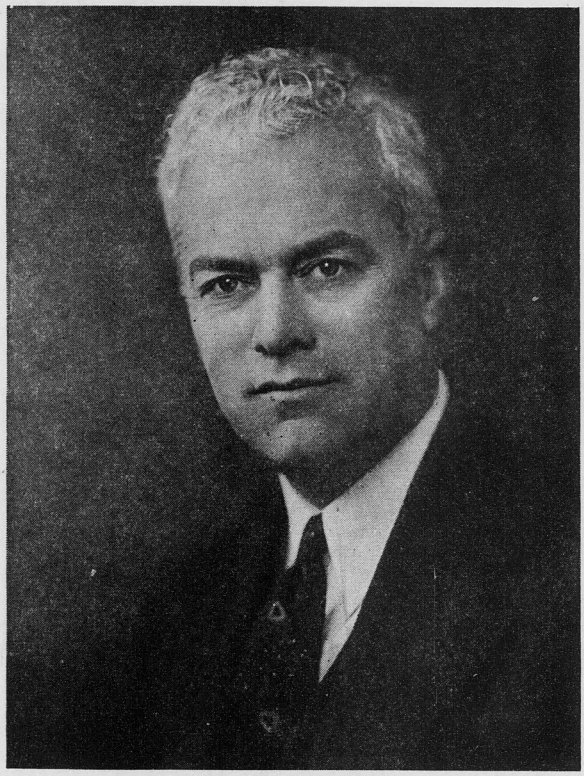
# Greetings

## To the Poultry People of Maryland



Dr. H. C. Byrd

AMONG all the uncertainties of this topsy-turvy world, one thing is certain—the United States must produce enormous quantities of eggs and poultry meat for our armed forces and civilians, and for the other Allied Nations. The Federal Government has asked the poultry industry to produce still more eggs and poultry meat during 1943 than in 1942, although last year's production was considerably in excess of 1941.

Hundreds of millions of pounds of dried eggs are being shipped to all parts of the world. Although no dried eggs are produced in Maryland, the enormous expansion of the dried egg industry has tended to strengthen the shell egg market. Eggs are an important source of protein and vitamins to balance the diet. Since poultry meat can be produced more quickly than beef, pork and lamb, the poultry industry can render a great service to the country by increasing production to alleviate the pending shortage of red meats.

It is obvious, therefore, that poultry producers must be more efficient than ever. I know that the poultry interests are anxious to do their part in the Food-for-Victory campaign. The University of Maryland stands ready at all times to be of the greatest assistance possible to the poultry industry of the State.

DR. H. C. BIRD

President, University of Maryland

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### MARYLAND TRI-COUNTY POULTRY ASSOCIATION

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# To the Poultry Producers of Maryland

THE successful management of poultry flocks and the efficient conduct of the poultry industry must be based upon exact scientific knowledge of poultry physiology, especially nutrition, poultry diseases, poultry inheritance, and other aspects of poultry life. To supply this important scientific knowledge requires men with intensive training in the methods of biological research in these basic fields. Economic aspects of the poultry industry also present problems requiring for their solution men highly trained in economic research.

Dr. C. O. Appleman

The Poultry Department of the University of Maryland as part of its educational program is performing a very important function in training young men and women for poultry research. A part of the student's training is the preparation of a thesis under the direction and supervision of a staff member. The scientific researches embodied in many of these theses make important contributions to poultry science and to poultry industry. Many of the graduate students get their apprenticeship in research by assisting staff members with Experiment Station projects and thereby render service to the Experiment Station while they are obtaining their training for research which is so important to the poultry industry.

The following definition of research by Charles Kettering seems to be especially significant in connection with applied poultry research at this time: "Research is simply to find out what you are going to do when you can't keep on doing what you are now doing."

DR. CHARLES O. APPLEMAN
Dean of the Graduate School
University of Maryland

## 1941 Poultry Income Reached All-Time High Record

THE gross income from eggs, broilers, farm chickens, and turkeys in Maryland was $5,102,000 greater in 1941 than in 1940. The 1941 income was the highest on record in the history of the poultry industry of the state. Comparative gross income figures for 1940 and 1941 for each branch of the poultry industry are given herewith, but do not include income obtained from ducks, geese, and guineas, for which no figures are available.

| | 1940 | 1941 |
|---|---|---|
| Market egg income | $6,406,000 | $7,790,000 |
| Commercial broiler income | 4,800,000 | 7,420,000 |
| Farm chicken income | 3,992,000 | 4,853,000 |
| Turkey income | 1,323,000 | 1,560,000 |
| | $16,521,000 | $21,623,000 |

Added to these figures should be the gross income from ducks, geese, and guineas, which probably amounts to about $250,000 annually. In addition, about $500,000 worth of poultry manure as fertilizer is produced each year. Also, over $2,000,000 worth of chicks are hatched each year.

It is estimated that approximately $3,000,000 worth of eggs and $1,000,000 worth of poultry meat are "imported" into Maryland each year from other states.

## Maryland Poultry Industry Data

| | 1938 | 1939 | 1940 | 1941 |
|---|---|---|---|---|
| | | (thousands) | | |
| Laying hens on farms Jan. 1 | 3,688 | 3,779 | 3,904 | 3,711 |
| Chicks hatched in hatcheries | 15,202 | 25,547 | 28,355 | 37,320 |
| Chickens raised on farms | 6,850 | 7,273 | 6,837 | 7,521 |
| Broilers raised commercially | 5,300 | 7,000 | 10,000 | 14,000 |
| Market eggs produced, dozens | 28,333 | 28,750 | 29,250 | 31,000 |
| Turkeys on farms Jan. 1 | 90 | 81 | 135 | 94 |
| Turkeys raised | 399 | 401 | 413 | 405 |

In 1941 the income from the poultry industry of Maryland amounted to over 20 per cent of the total income obtained from crops, livestock, and livestock products.

## Estimated Egg Production per Bird in Maryland

| 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 |
|---|---|---|---|---|---|---|
| 98 | 101 | 107 | 110 | 109 | 110 | 110 |

# To the Maryland Poultry Producers

IT HAS been a real pleasure and satisfaction to me for the past several years to work with the Maryland poultrymen on their disease control problems. As the industry has developed in size, the problems have increased in number. It was found that our one laboratory at College Park was unable to meet the needs of the changing conditions and to render the services necessary in controlling and eradicating poultry diseases.

Dr. Mark Welsh

The State, therefore, in cooperation with the counties, has provided diagnostic laboratories in Salisbury and Centreville in addition to the research and diagnostic laboratory at College Park. The use made of these facilities is best indicated by the fact that very few specimens were submitted for diagnosis from the Eastern Shore prior to 1936 when laboratory service became available. Last year approximately 450,000 examinations were made by these two laboratories on specimens submitted while nearly a million specimens were examined for the State as a whole.

Pullorum infection in our breeding flocks has in the past six years been reduced from approximately 15 per cent to less than 3 per cent at the present time and it has been entirely eliminated from many flocks. There is every evidence that this costly disease can be effectively controlled through present practices. Reduction in losses from many other diseases may also be confidently expected through the use of existing facilities and the employment of intelligent sanitary, feeding and management practices.

There are, unfortunately, many unsolved problems which need further investigation and attention is being given to them as rapidly as possible. The closest of cooperation must be maintained among all groups interested in the poultry industry if losses are to be avoided and profits anticipated.

Few, if any, states have as adequate facilities as has Maryland for assisting poultrymen in the control and eradication of avian diseases. Infectious diseases on a man's premises is not a private misfortune only but it is a menace to his community and a danger to the industry. It is only through the fullest use of the disease control facilities provided by the State that personal losses can be reduced and epidemics avoided.

DR. MARK WELSH

Director, Live Stock Sanitary Service

# CARADEE

## A CARROT OIL PRODUCT

**WHAT IS CARADEE?**

CARADEE is an improvement over cod liver oil. Therefore feeds that contain CARADEE in correct balance may be expected to give better nutrition to your flock.

**HOW IS CARADEE MADE?**

CARADEE is a combination of carrot oil as a source of carotene pro-vitamin A, wheat germ oil and Du Pont's Delsterol, made into a dry Mix with bran, middlings, oat meal and alfalfa leaf meal as carriers.

**WHAT VITAMINS DOES CARADEE PROVIDE?**

CARADEE provides guaranteed amounts of carotene as a source of vitamin A activity, wheat germ oil as a source of vitamin E, and Delsterol as a chick tested source of vitamin D, in proportions that experience has shown to be highly effective, when properly used.

**HOW IS CARADEE AN IMPROVEMENT?**

CARADEE is an improvement over cod liver oil because it is easier to use and gives better nutritional results. Being a dry mixture, no pre-mix need be made. As CARADEE is guaranteed to contain no cod liver oil or other fish oils, there can be no interference with the utilization of vitamin E reported to occur when cod liver oil is used in the mash (J. C. Hammond, Beltsville Expt. Sta., Poultry Science, July 1941, page 369). Furthermore, the presence of carrot oil in CARADEE helps to prevent or control outbreaks of colds among poultry during the winter months, helps to increase hatchability of eggs and to speed up the growth of chicks.

**HOW LONG HAS CARADEE BEEN USED?**

CARADEE has been used by poultrymen and feed mixers since 1937, and has given uniformly successful results everywhere. Poultrymen report better flock nutrition, and feed men better sales when they use CARADEE in their poultry feeds.

**WHAT ABOUT COST?**

The delivered price compares favorably with the cost of cod liver oil, and is often less, in spite of the greater value.

**HOW IS DRY CARADEE USED?**

The same as cod liver oil, except that no pre-mixes need be made. Mixers who are accustomed to 85 D cod liver oil use one-half as much 180 D CARADEE; mixers who are accustomed to 400 D fortified oil, use 400 D CARADEE, pound for pound the same as fortified oil.

*Ask for delivered prices*

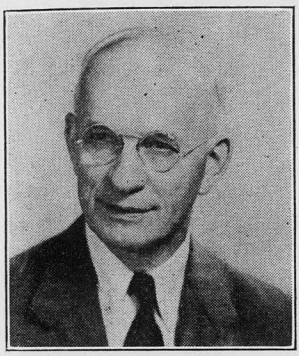
Manufactured and Guaranteed by

**Nutritional Research Associates, Inc.**

**255 Broad Street** **South Whitley, Indiana**

# To the Poultry Interests of Maryland

To the men and women who have done and are going to do so much to promote the splendid poultry industry of Maryland, I welcome the opportunity to address a brief message regarding the recently launched "Maryland Quality Egg Program." This is a project designed to increase the consumption in Maryland of **Fresh Eggs From Maryland Farms.**



**Dr. F. B. Bomberger**

The Policy Committee of the Maryland State Poultry Council, having noted the general dissatisfaction arising from the enforcement of the Maryland Fresh Egg Law, recommended the complete reorientation of the administration of the law. Emphasis, the Committee suggested, should be placed on education and promotion rather than on coercion by inspection.

Conferences with producers, wholesale and retail distributors, and other interested persons resulted in enthusiastic endorsement of the Committee's idea. Hence, the "Maryland Quality Egg Program."

Mr. Wade H. Rice, Extension Poultry Specialist, well known to the poultry industry, is in charge of the project. By the use of circulars, pamphlets, newspapers, special bulletin boards in retail stores, radio talks and demonstrations by Home Economics specialists, and by every other practicable means, efforts are being made to educate consumers to know and appreciate quality in eggs so that they will ask for fresh eggs in making purchases. At the same time by personal interview and direct contact, efforts will be made to convince retail dealers that it will pay them to advertise and sell fresh eggs as "fresh."

Special circulars will be prepared showing to the dealers, and also to the producers and consumers how to **keep fresh eggs fresh** through proper handling. The policy is to persuade and convince rather than coerce. There will, however, be inspections to protect the honest dealer.

A cooperative program like this, in the interest of producer, distributor and consumer, deserves your support. Let's all get together to market more **Fresh Eggs** from **Maryland Farms.**

DR. F. B. BOMBERGER

Coordinator of Marketing Work

# "Food Will Win The War and Write the Peace"

CLAUDE R. WICKARD
*Secretary of Agriculture*

With the food requirements of the United Nations ever increasing the Department of Agriculture has asked for even greater production of farm products in 1943.

The poultry industry is called upon to produce as many pounds of meat, and as many dozens of eggs, as possible. To accomplish this, quality feeds are needed.

Poultrymen are finding the answer to their feeding problems in HEN-CEN-MIX. This complete Vitamin-Protein-Mineral Supplement supplies all elements necessary for quick sturdy growth and high egg production. Since we control most of our sources of supply, even though some of the essential ingredients of HEN-CEN-MIX are scarce today, we can still guarantee its uniformity.

Write to us. Our trained men will be glad to work out with you the best HEN-CEN-MIX formula for your particular needs.

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SUPPLY CO., INC.

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Nutritional Assistance and Service Work a Part of our Program

WRITE US FOR FULL INFORMATION

# Farm Women's Part in Increasing Egg and Poultry Production

ON a large percentage of farms, the farm poultry flock has always been the farm woman's flock. The women and girls have not only handled the poultry, but the income derived therefrom has provided many things needed or desired by the family. The eggs and meat have been substantial items in the family food supply.

Miss Venia M. Kellar

It is not too much to say that during the recent depression years the cash income from poultry enabled many farm families to meet fixed expenses, keep children in school, provide more nearly adequate clothing, and in many other ways continue their farm life on a better standard of living than would have been possible otherwise.

Now the Federal Government is asking for greatly increased production of eggs and poultry meat. The farm flocks of the country have always provided a substantial percentage of these products and the needs in the immediate future place added responsibility on those who handle those flocks.

Women throughout Maryland, as well as the other States, are answering the call for help in the National food program. They can and will expand their activities with poultry. Both the women and 4-H club girls feel that helping to meet the Government's request for increased egg and poultry production is an opportunity to do their part on the home front. We may confidently expect to find many small farm flocks doubled in size during the coming year, greater attention given to efficient feeding and management, and small flocks on many of the comparatively few farms in the State where they have not ordinarily been raised.

More poultry and eggs will be served on Maryland tables this year. That is in line with the "Better Family Living" program which the Extension Service has been emphasizing for a number of years. More people now realize the nutritional value of eggs, and probably no other single article of food can be utilized in so many dishes. The limitations on red meat available will result in greater use of poultry meat, which has always been a prominent item on the farm family table.

In brief, we can depend upon the rural women of Maryland, with the help of the boys and girls, to do their full part in providing the vitally needed eggs and poultry meat.

MISS VENIA M. KELLAR
Assistant Director of Extension
University of Maryland

# *Eggs* ARE AMMUNITION

Vital foods like eggs are as important as ammunition in helping to win our war. That's why it's so important how you feed your birds. But in these days of National crisis, keeping the poultry flock supplied with necessary nutrients is often difficult. Normal supplies of customary ingredients have been turned upside down. To build a ration today, it is necessary to turn to unaccustomed sources for part of the vitamins and proteins and to blend the "usual and unusual" into a mixture that meets nutritional needs.

Purina Mills are in a strategic position to meet this situation. In addition to the wealth of information available from state and federal agricultural experiment stations, Purina has the advantage of 20 years of private research. Purina has perhaps the best laboratory for testing the feeding value of ingedients and mixtures, including machines built exclusively for Purina's use. Purina has the advantage of a nation-wide buying organization for securing hard-to-get ingredients.

These factors are valuable in normal times; in times of emergency, they are invaluable. Use them to your advantage by feeding Purina poultry rations. See your dealer or write to

## PURINA MILLS

ST. LOUIS

BUFFALO WILMINGTON

# Securing Good Chicks

By Morley A. Jull, *University of Maryland*

MOST of the chickens raised in Maryland every year are hatched in hatcheries. Since so many of the chickens raised each year are secured as chicks from hatcheries, it is quite apparent that the hatcheries occupy a very important place in the poultry industry. The quality of chicks produced by hatcheries determines very largely the results secured by those who purchase the chicks for meat or egg production. Probably over 95 per cent of all chicks hatched in Maryland every year are White Leghorns, Barred and White Plymouth Rocks, New Hampshires, Rhode Island Reds, White Wyandottes, and crossbreds. The customer's chances of securing the quality of chicks desired are greater when chicks of these varieties are ordered than when chicks are ordered belonging to breeds and varieties that are bred to a limited extent only.

When intending to purchase day-old chicks from a hatchery, a person should take into consideration several factors in the operation of different hatcheries before deciding from which one to purchase. There are certain advantages in purchasing from a local hatchery in the community, provided the chicks of the desired quality can be secured. Find out as much as possible about the kind of selection and breeding program that is being carried on with the flock or flocks supplying eggs to the hatcheries.

Find out if the hatchery is clean and sanitary and operated efficiently. Find out if the hatchery operator is paying a reasonable premium for the hatching eggs that he purchases. These are some of the more important things that should be considered before considering the price of the chicks offered by a hatchery operator.

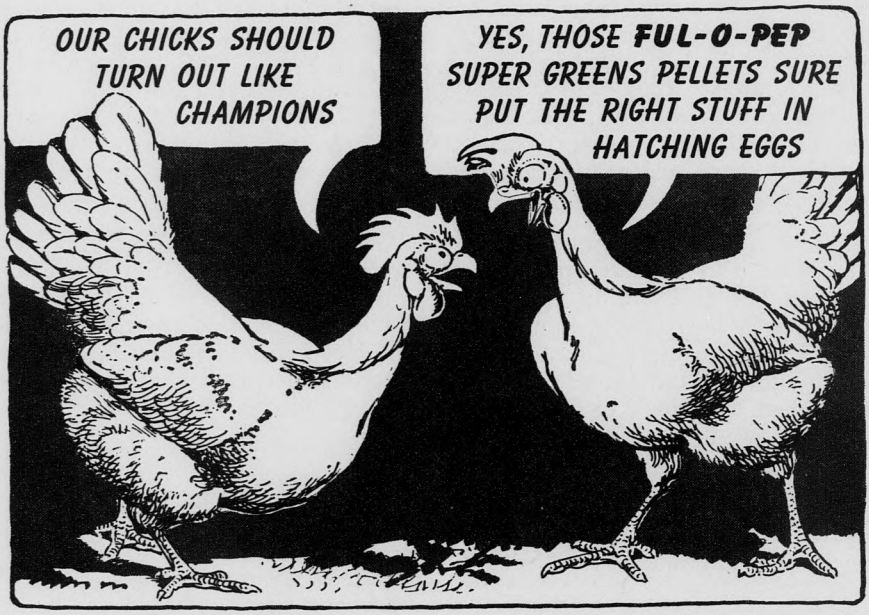
Above all, a person intending to purchase chicks should realize that good chicks cannot be hatched from poor eggs. If the hatchery operator is not carrying on a sound selection and breeding program and is not having his breeding stock officially tested for the pullorum disease his chicks could not be expected to give the most satisfactory results.

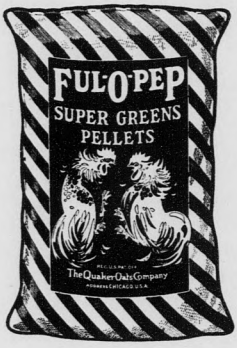
Find out if the hatchery operator is carrying on a pullorum-testing program under the supervision of the State Livestock Sanitary Laboratory.

Hatchery operators who cooperate with an official state agency in complying with the provisions of the Maryland Poultry Improvement Plan may advertise and sell either pullorum-controlled, pullorum-passed, or pullorum-clean chicks, the last being the most desirable.

# LET SUPER GREENS PELLETS HELP YOU GET BETTER HATCHES AND STRONGER CHICKS IN 1943!

***Concentrated Spring Range* in Ful-O-Pep Feeds Furnishes Needed Vitamin Boost for Breeders!***


OUR CHICKS SHOULD TURN OUT LIKE CHAMPIONS
YES, THOSE FUL-O-PEP SUPER GREENS PELLETS SURE PUT THE RIGHT STUFF IN HATCHING EGGS




YOU can help improve hatchability and livability in 1943 chicks by feeding your breeders now on Super Greens Pellets, as a supplement to the regular mash.

These pellets are packed with vitamin sources like Concentrated Spring Range,* Nature's Richest Vitamin Combination, that help breeders produce big, husky chicks with deep, yellow color shanks indicating good health.

To fortify breeder birds by a high vitamin intake, to get good hatching eggs, supplement your regular feed with Ful-O-Pep Super Greens Pellets. For complete details, write

**THE QUAKER OATS COMPANY, CHICAGO, ILL.**

*Reg. U. S. Pat. Off.

# Poultry Feeds in Wartime

By Herbert R. Bird, *Universtiy of Maryland*

THE orderly progress in poultry feeding practice in the last 25 years justifies considerable pride on the part of poultrymen, feed men, and research workers who have contributed to it. New methods and ideas have been thoroughly tested experimentally and, if found useful, have been promptly applied in practice. The present emergency, by its effects on production and transportation of feedstuffs and on demand for the products of the poultry industry, has destroyed some of this orderliness. Some changes have had to be made without the benefit of thorough preliminary testing, and such changes will be demanded more and more often in the immediate future. This situation greatly increases the importance of any experimental work which can be done in anticipation of problems which are likely to confront us with the suddenness of the "blitz."

The following mash formula appeared revolutionary as recently as six months ago. It has been thoroughly tested as a starting and growing mash and broiler mash in the Department of Poultry Husbandry of the Maryland Agricultural Experiment Station. Results with this mash have been excellent.

| | |
|---|---|
| Ground No. 2 yellow corn | 30 |
| Ground heavy oats | 10 |
| Wheat bran | 10 |
| Wheat flour middlings | 10 |
| Alfalfa leaf meal | 5 |
| Soybean oil meal | 24.5 |
| Fish meal or dried skimmilk | 4 |
| Butyl fermentation residue (80 micrograms riboflavin per gm.) | 1.5 |
| Steamed bone meal or Defluorinated calcium phosphate | 2 |
| Oystershell flour or ground limestone | 1.5 |
| Vitamin A & D Feeding Oil (85 D, 600 A) | 1 |
| Salt | 0.5 |
| Manganous sulphate | 0.012 |

The wheat flour middlings in this formula could be replaced by ground wheat. The A and D feeding oil could be replaced by D-activated animal sterol provided the alfalfa leaf meal is of sufficiently good quality. Other sources of riboflavin can replace the butyl fermentation residue but all sources of riboflavin will not give equally good results. The fish meal or dried skimmilk cannot be satisfactorily replaced by meat scrap.

This formula has not been thoroughly tested as laying mash formula, but it has been used as such with satisfactory results. An additional 1% of bone meal should be included if the mash is to be used for this purpose.

# *Really* . . . HOW PRACTICAL

***is your feeding Program?***

The true value of any feed is the unit feeding cost per bird per year—and that takes in Hatchability, Chick Mortality, Growth, Egg Production and Breeder results. D & G feeds are so practical because they assure good results in all these stages and yet keep feeding costs low enough to yield you a fair profit.

★ *IF PROFITS ARE WHAT YOU WANT*

*try* **D & G** *feeds*

DIETRICH & GAMBRILL Inc., FREDERICK, MD.

# Beacon Steel Products Company

ARTHUR SCOTT, Owner

*Manufacturer*

**"Bestof All" Poultry Equipment**

*Maryland Made and Tested*

**BROODERS**
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**BATTERIES**
**FOUNTAINS**

*The World's Largest Manufacturer of Thermostat Wafers*

Visit Our Factory and Let Us Show You the

New 1943 Equipment

*Manchester Road*

**Westminster, Md.** **Phone 460**

"BRING SCOTT YOUR POULTRY PROBLEMS"

# Factors Affecting the Hatchability of Turkey Eggs

By R. E. Phillips, *University of Maryland*

IT is particularly important under the present war-time conditions that the management program of the turkey breeding flock be planned in such a way as to obtain maximum hatchability throughout the breeding season.

Poor fertility is a serious problem during the early hatching season. This condition may be due to the lack of activity of the toms, preferential mating, too great a difference in the body size of the males and females, sterility, fighting, and other factors.

The use of electric lights appears to improve the breeding activities of the flock. Indications are that the males respond less rapidly than the females so it is desirable to use lights well in advance of the normal breeding season. When the breeding flock is separated into small units and pedigreeing is not done, poor fertility due to preferential mating or fighting can be minimized by rotating the toms every day or two. If exceptionally large toms are used, poor fertility usually results unless the hens are correspondingly large in size.

Turkey hatching eggs should be collected several times a day during the summer months and should be held at a temperature of 50-55°F until incubated. The hatching power of eggs declines very rapidly if they are not set within two weeks of the time they are laid. If sufficient volume is available, the eggs should be set each week. A basement or cellar is a good place to hold the hatching eggs provided it is cool. An ordinary 30-dozen egg case containing duck egg fillers is very satisfactory for holding the eggs until they are incubated.

Relatively little experimental work pertaining to the incubation of turkey eggs has been done, so many of the present day recommendations are based on the results of incubated chicken eggs. During the last 3 or 4 days of the incubation period the best results have been obtained when the incubation temperature is decreased about 2 degrees and the humidity is increased.

Medium size turkey eggs hatch better than either large or small eggs. Preliminary investigational work at the University of Maryland Poultry Department indicates that the occasional calcareous deposits found on the egg shells do not affect the percentage hatchability. There is some evidence that turkey eggs which have a chalk white shell give poor hatchability.

# "Let's sell more poultry these meat-short days!"

That's been A&P's program ever since meat supplies began to decrease—due to our military and Lend-Lease needs.

Push poultry sales!

A&P's program has received powerful promotion in the usual channels—newspaper advertising and display materials in the meat departments—and in unusual channels, too.

For instance, prior to the Thanksgiving season, A&P Bakeries created a special Marvel Stuffing Bread, advertised it most effectively in A&P's Baked Goods Departments and did much to increase holiday turkey sales.

All this is in character with A&P's complete effort to meet the food situation and support the government.

If the program to "sell more poultry" has benefitted the Poultry Industry, A&P feels that it has accomplished something very worthwhile.

A&P
ESTABLISHED 1859
FOOD STORES

*National Egg & Poultry Department*

**THE GREAT ATLANTIC & PACIFIC TEA CO.**

**GRAYBAR BLDG. NEW YORK**

# Managing the Laying Flock in Wartime

By Geo. D. Quigley, *College Park, Maryland*

WHILE we cannot foresee the complete effects of the war upon the poultry industry, it appears at the present time that the most serious impacts are in the fields of labor supply, and in the supply of certain essential feedstuffs. Accordingly the following suggestions are offered along those lines.

**Poultry Rations.** 1. Feed ingredients such as meat scrap, fish meal, milk, cod liver oil, and alfalfa leaf meal either have been scarce, or there is evidence of prospective shortage. In some cases the quality upon the market has deteriorated. It has thus become increasingly difficult for the small or home mixer to obtain the qualities he would normally purchase, and he is apt to experience some embarrassment attempting to maintain production results with substitute materials. There are two courses open: A--Complete protein mixtures, in some cases with trace elements added, are now upon the market. The buyer of ingredients buys one single product to mix with the usual ground grains and milling byproducts. B—Tie up with a good commercial brand of feed and thus employ the services of a skilled feedstuffs specialist in the matter of the purchase and combination of feedstuffs for best results.

**Labor Saving.** 2. It is difficult to greatly reduce the amount of work necessary for the care of the laying flock, but certain measures will greatly reduce either the expenditure of time or energy or both.

**Water.** It is of extreme importance that layers have water to drink at all times. The egg is about 65% water. A person carrying water to 100 hens, over a distance of 60 feet one way will use around 10 minutes per day for that purpose and will thus lug in the average year around 9 TONS of water for this many chickens. Where it is possible to convey water under pressure to the poultry house, it will be possible to keep the chickens watered with a saving of about 90% in time and 99% in labor energy expended. Furthermore, when using automatic watering devices the chickens are always watered, and that usually makes an increase in annual egg production.

Water pipe is difficult to obtain, but farmers to date have been able to get electric pumps.

There are many cheap float valves for keeping a supply of water available to the chickens. Where water is abundant the newer bubbling type, constant flow fountains are wonderful, and they eliminate much of the worry of keeping drinking water and pipes from freezing in cold weather.

**Built-up Litter.** It requires around 2 hours of time to renew and replace the litter in a 100 bird pen. Litter removal becomes a frequent chore in December, January, and February because of excess dampness. When there seems to be no sanitary problem involved, the use of the built up litter system is a labor saving device. Furthermore the litter will remain dryer and the birds more comfortable than in pens which are frequently cleaned. In September or October in Maryland the soiled litter is replaced with about 1½" of straw or other litter. When this breaks up an additional layer of 1" of fresh material is added and so on until up to 6" of finely divided material is present. This is removed in March.

**Droppings Pits.** Droppings pits or screened droppings boards save la-

MEMBER
Dr. Salsbury's
Nation-wide POULTRY
HEALTH SERVICE

# The Sign

## OF *DEPENDABLE* POULTRY HEALTH ADVICE

Poultry health's both profitable and patriotic. Every bird and egg is needed. Poultry raisers rely on Dr. Salsbury dealers for sound advice. Behind every Dr. Salsbury dealer are the years of research, the scientific production and information facilities, of Dr. Salsbury's Laboratories.

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COMES *FIRST* IN POULTRY HEALTH

*Use this* Powerful, *All-Purpose* Disinfectant with *A Pleasant Odor*

***Safe*** — **Won't harm chicks or older birds;** you can use Par-O-San while they're in the house. **Won't damage equipment.**

***Certain*** — **Kills common disease germs and bugs on contact.** Even pullorum, fowl pox, cold organisms, mites, worm eggs, coccidia.

***Pleasant*** — **Pleasant odor. Stainless. Non-caustic;** used as directed, won't burn or irritate your skin.

Par-O-San stops those "disinfecting headaches"! **Economical,** too. Dilutes in **either** oil or water. Effective solution when diluted 1 to 100!

A **COMPLETE** LINE OF SCIENTIFIC POULTRY HEALTH PRODUCTS

## Medication

**AVOID UNNECESSARY LOSSES**

No need to stand idly by while parasites and disease kill birds your country needs. Take precautions; fight disease when it occurs. There's a Dr. Salsbury product for every poultry health purpose. Behind each is a scientific attitude, extensive research, testing in-actual-use, and scientific production control for uniform high quality. The name — **Dr. Salsbury** — is your assurance of satisfaction.

PHEN-O-SAL: The **double-duty** drinking water medicine. (1) **Inhibits germ growth** in drinking water; (2) **Medicates** bird's digestive system.

CAN-PHO-SAL: Scientifically compounded. Use when you want a good spray and inhalant for chicks, poults, or for chickens or turkeys of any age.

## DR. SALSBURY'S *Laboratories*

**CHARLES CITY, IOWA**

**A Nation-wide Poultry Health Service**

bor because they enable one to postpone removal of manure until an opportune time. It is seldom necessary to remove manure from droppings pits during the entire winter; the capacity of droppings boards is more limited. There is a real shortage of wire for constructing these devices with no satisfactory substitutes yet worked out.

**Better Stock.** Most of the performance of a layer is inherited and must come from its parents. Current profitableness of poultry production enables one to purchase the best stock for greater production effiiency.

**Cull!** Swat the loafer and the bird of low vitality. Replace her with a better bird.

**Fall Hatch.** A fall hatch in September enables one to practice a more severe culling program and at the same time to keep the laying house going at full speed.

**Range Shelter.** A good portable range shelter saves labor in rearing pullets, and does a grand job of producing healthy, money-making pullets.

**Lights.** Employ dim all-night lights where black-outs are occasional. Thus turning out the light for short periods is not harmful. In dim-out and permanent black-out areas, special screening devices are necessary.

**Broilers.** Where facilities are available, a fall or winter crop of broilers may be started. This is at present a profitable and patriotic duty.

**Brooders.** New brooding equipment should be wood, coal, or electricity burning, although the ability of power companies to maintain service to rural areas may deteriorate as the war progresses. If there is wood on the farm, that is probably the safest bet; if not, coal looks best to this observer.

## Factors that Bring Profits in Egg Production

In a six-year study of profit-making factors in egg production in Illinois, it was found that the following four efficiency factors greatly influenced the profits obtained per flock: (1) size of flock; (2) eggs per bird per year; (3) laying flock mortality; (4) proportion of pullets per flock.

The average size of these flocks was 434 birds. It was found, however, that flocks of about 600 birds were more profitable than smaller-sized flocks.

The following data show the net profits per flock arranged according to: (1) those flocks that did not obtain results approaching the average obtained by the 434 flocks in any of the four efficiency factors listed above; (2) those flocks that excelled in one factor; (3) those flocks that excelled in two factors; (4) those flocks that excelled in three factors; (5) those flocks that excelled in all four factors.

| Number of factors in which flocks excelled | Average net profit per flock |
|---|---|
| None | $31 |
| One | 37 |
| Two | 114 |
| Three | 274 |
| Four | 441 |

# Christie's NEW HAMPSHIRES Burst Forth FULL OF SPIZZERINKTUM

## "SPIZZERINKTUM"

### *The Password to Profit*

On the Peninsula and throughout Maryland, poultrymen know Christie's SPIZZERINKTUM New Hampshires as the strain they can depend on for quick, sure profits. And wherever the market calls for Barred birds, Maryland poultrymen choose SPIZZERINKTUM Chris-Cross Hybrids with the utmost confidence.

For 20 years SPIZZERINKTUM New Hampshires have been bred for those qualities which make for greater and better production of both meat and eggs. Check the following profit factors; you'll find them all present in SPIZZERINKTUM New Hampshires, and also to a very considerable degree in SPIZZERINKTUM Barred Rocks.

★ HIGH FERTILITY AND HATCHABILITY
★ HIGHER LIVABILITY OF CHICKS
★ FASTER GROWTH—EARLIER MATURITY
★ EARLY COMPLETE FEATHERING
★ UNIFORM COLOR AND BODY TYPE
★ QUICK MATURITY OF PULLETS
★ LARGE EGGS OF HIGH INTERIOR QUALITY
★ EXTREMELY LOW MORTALITY OF LAYERS

**ALL BREEDERS N. H. - U. S. PULLORUM CLEAN**

**Straight NEW HAMPSHIRES** **Straight BARRED ROCKS**

**CHRIS-CROSS ROCK-HAMP HYBRIDS, Barred**

**Weekly Hatches the Year Around—Sexing Service**

*FREE Catalog* describes the famous SPIZZERINKTUM strains and our Price List gives up-to-the-minute information. Write for your copy.

SPIZZERINKTUM Chicks are in such great demand that it is imperative to anticipate requirements and make reservations well in advance of shipping dates.

# ANDREW CHRISTIE

**BOX 33** **Kingston, New Hampshire**

# Fresh Eggs to the Front

W. H. Rice

SINCE fresh eggs contain 11 of the 12 essential nutrients of the daily requirements of man, our government has requested the poultry industry to produce more eggs as a direct contribution to our Food-for-Victory Program. This program affords the poultry industry a unique opportunity, not only for service to all mankind, but also to popularize its chief product, *fresh eggs.* Such a program was first projected in Maryland in 1935, and definite progress has been made. However, the field of consumer education remains virtually untouched.

The Maryland Egg Quality Program, functioning as a consumer information service, is designed to fill this need. Under the administration of the University of Maryland Extension Service, it aims at development of greater consumer appreciation of *fresh eggs* in contrast to non-fresh eggs.

Since cooperation is the keynote in this undertaking, the united support of consumer organizations, public utility home service specialists, home economists, civic organizations, etc., is being enlisted in this work. Various means, including attractive circulars, demonstration meetings, retail store bulletin boards, news items, radio scripts, window displays, etc. are being employed. Full cooperation is being given by the Poultry and Egg National Board and the New England Fresh Egg Institute, and their wealth of material and experience is being utilized wherever practicable.

To facilitate and simplify the purchase of *fresh eggs* by Maryland housewives, a program of cooperation with wholesale and retail merchants is being developed. The consumer must have a fair chance to buy *fresh eggs.*

When a producer sells *fresh eggs* to a wholesaler who supplies a retailer, who in turn supplies the customer with *fresh eggs,* each not only renders a public service but also makes a profit. Such a series of transactions must be encouraged, and they must be protected from those who may seek to sabotage the public interest and the poultry industry by fraudulently selling low grade eggs as *fresh eggs.*

The Maryland Egg Quality Program seeks these objectives through education and cooperation. This is a longtime program in which good will must pave the way.

*Poultrymen produce a protective food! Cooperation and education* must be developed to *protect the food and the industry!*

# SAM RICE'S

(Specializing)

**STRAIGHT NEW HAMPSHIRE DAY - OLD CHICKS**

also

**HATCHING EGGS**

*Order Now*

**Write for Price List**

**SATISFACTION GUARANTEED**

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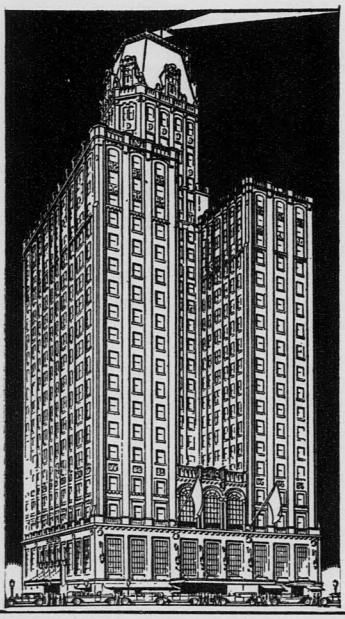
**ASHTON, MD.** **Phone: Ashton 2411**



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*The* **LORD BALTIMORE** *Hotel*

BALTIMORE, MARYLAND

## Why Use R. O. P. Males?

CHAS. S. WILLIAMS, *University of Maryland*

AS a result of shortages of labor and equipment, chickens that will produce eggs and poultry meat efficiently are more essential than ever before due to the great need for increased production for our fighting forces and Allied nations. One of the best ways to meet the increased production and still use the same equipment is through the use of R. O. P. males in hatchery supply flocks.

The average egg production of all Maryland R. O. P. pedigreed candidates in 1941 was 158 eggs while the average egg production in farm flocks was 112 eggs. This is a difference of nearly four dozen eggs per bird. The greater part of this difference can be attributed to breeding.

Maryland R. O. P. breeders are striving to produce birds that not only meet the requirements of R. O. P. as far as egg production and egg weight are concerned but are also observing their birds for such things as rate of growth, early feathering and many other factors. While this is not a R. O. P. requirement, it is very necessary in order to produce superior breeding stock.

The use of R. O. P. males has been considered by many hatcherymen as being too expensive to use in hatchery supply flocks. The cost is not prohibitive when one stops to consider the quality of chicks produced, customer satisfaction, and the extra cost per chick produced.

Maryland hatcherymen could well afford to use many more R. O. P. males in their hatchery supply flocks each year. It is to be hoped that in the near future all hatchery supply flocks will be mated to R. O. P. males or sons of R. O. P. males.

## Waterfowl Feathers for Armed Forces; Chicken Feathers for Civilians

The armed forces need large supplies of waterfowl feathers for many purposes, such as stuffing in sleeping bags and hospital pillows, lining for coats and soundproofing military equipment. Some feathers are also being used in camouflage operations.

Feathers from chickens and other fowls are being used to fill civilian needs. In poultry dressing plants chicken feathers are pulled from the chicken's back and they are dumped into special washing machines and cleaned. After drying, they are stuffed in bags or bales and are ready to be sold to the feather processor. The processor in turn washes the feathers with soap and chemicals; then they are steamed, dried and disinfected. After sorting, the best of the lot are "curled" and are then ready to be stuffed into upholstery, or bed pillows or prepared for other civilian needs.

## Many Maryland Flocks and Hatcheries Qualify for U. S. Pullorum-Controlled Rating

All hatchery flocks and all hatcheries whose flocks have *less than 2 per cent reactors* qualify for the U. S. Pullorum-Controlled rating, which is one stage above the U. S. Pullorum-Tested rating formerly used by most Maryland flocks. Flocks having 2 per cent or more reactors should be retested not less than 30 days thereafter until *less than 2 per cent* were present on the last test. Maryland flock owners are very fortunate because retesting costs them nothing.

# 105 Million Birds Immunized

## in the past 10 years without a Single Failure

TRACHEITIS is the most terrible scourge of the Poultry Industry. Like lightning, this dread disease can strike without warning.

Vaccination with VINELAND TRACHEITIS VACCINE will absolutely prevent this disease. Should vaccination be neglected and an outbreak occur, our prompt service will enable you to check the contagion within a few days.

FOWL POX, too, causes widespread loss by interrupting egg production, yet it can be readily prevented by immunizing the birds with VINELAND FOWL POX VACCINE, or in the case of layers, with VINELAND PIGEON POX VACCINE. The latter is so mild that it does not interrupt egg production.

Because of their demonstrated purity and potency, VINELAND VACCINES are in regular use by these leaders:

**55%** of all the R. O. P. Breeders of America

**50%** of the official Egg-Laying Contests of the United States

**92** State Institutions of the United States

**CHICK-EMBRYO—EGG-PROPAGATED**
**Hermetically Sealed in Vacuum**

All our Chick-Embryo Origin, Egg-Propagated Vaccines are sealed in vacuum in glass ampoules. There is no possibility of contamination or the transmission of other poultry diseases.

**VINELAND POULTRY LABORATORIES SERVICE RECORD**

1. Our Director was the FIRST veterinarian in the United States to devote full time and attention to the treatment of Poultry Diseases.
2. Ours were the FIRST laboratories in the United States to manufacture only approved diagnostic and preventive agents.
3. Our Laboratories were the FIRST to obtain a permit from the U.S. Dept. of Agriculture to manufacture Tracheitis Vaccine.
4. Our Laboratories were the FIRST to obtain a permit to manufacture Chick-Embryo Origin Egg-Propagated Tracheitis, Fowl Pox, and Pigeon Pox Vaccines.
5. Our Laboratories were the FIRST to seal, in vacuum, Tracheitis Vaccine, also Fowl Pox and Pigeon Pox Vaccines.

**VINELAND TRACHEITIS VACCINE**
**VINELAND FOWL POX VACCINE**
**VINELAND PIGEON POX VACCINE**
**VINELAND STAINED ANTIGEN**

**Don't Be Misled**

There is only ONE Vineland Poultry Laboratories in Vineland, and it has no connection with any other concern. For safety's safe, get your Vaccines from the pioneer manufacturers or their representative.

**LOOK FOR THIS TRADE-MARK**

This registered Trade-Mark appears on all labels and wrappers. None can be genuine without it. Read carefully the dosages on the labels; our dosages are almost double those given by others, yet Experiment Stations insist that the amounts we use are essential for complete protection.

FREE: Our famous handbook, "Science Safeguards Your Flock Against Disease." Write for your copy.

**Our Vaccines are produced under U. S. Veterinary License No. 196 issued by U.S. Dept. of Agriculture.**

## VINELAND
## Poultry Laboratories

**DR. ARTHUR D. GOLDHAFT, V.M.D.,**
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**Box 70-MM** **VINELAND, N. J.**

**LOOK FOR THIS NAME** **AND THIS TRADEMARK**

**VINELAND VACCINES**

## Fuel Costs in Brooding

THE Vermont Agricultural Experiment Station compared the fuel cost of brooding chicks with electric, coal-burning and oil-burning brooders, 250 chicks being started in each brooder. The test ran for 7 weeks from January 22 to March 12, 1938. On three different days during the test, the temperature was below zero. The electricity consumed by the electric brooder amounted to 256 kilowatt hours; the amount of hard coal used by the coal-burning brooder was 930 pounds; the amount of oil used by the oil-burning brooder was 93½ gallons. The rate of growth, rate of feathering, and mortality were about the same in the three groups.

The Virginia Agricultural Experiment Station conducted an 8-week test beginning February 11, 1936, by placing 100 Barred Plymouth Rock and 100 Rhode Island Red chicks under each of the following four kinds of brooders: home-made, electric, coal-burning, wood-burning, and oil-burning. The following results were secured:

| | No. chicks reared | Ave. wt. per chick lbs. | Fuel consumed | Hours of labor | Cost of fuel and labor |
|---|---|---|---|---|---|
| Electric | 186 | 1.42 | 387 kwh | 6½ | $13.24 |
| Coal | 198 | 1.55 | 1326 lbs. | 34 | 11.56 |
| Wood | 191 | 1.40 | 124 cu. ft. | 23 | 11.58 |
| Oil | 184 | 1.42 | 132 gals. | 24 | 21.84 |

The New Hampshire Agricultural Experiment Station compared the labor and fuel cost of brooding with electric and with coal-burning brooders, there being 250 chickens per brooder. The brooding period was 6 weeks. The following results were secured.

| | Hours of labor | Labor cost at 30c per hour | Kwh. used | Cost of electricity hours at 3c per Kw. | Lbs. coal | Coal cost at $16.00 per ton | Total labor & fuel cost |
|---|---|---|---|---|---|---|---|
| Electric | 10:15½ | $3.08 | 426 | $12.78 | | | $15.86 |
| Coal .. | 14:19½ | 4.30 | | | 1512 | $12.08 | 16.38 |

It is pointed out, however, that in brooding with electric brooders 2 more bales of shavings were used for litter than in brooding with the coal-burning brooders. When the extra cost of these shavings is added to the total cost of labor and fuel in electric brooding there is practically no difference in the cost of brooding by these two methods.

## Lighting Turkey Breeders Profitable

Artificial lighting of turkey breeders proved to be definitely profitable according to results secured at the Oklahoma Experiment Station. With all-night lights, egg production commenced in 3 weeks; with morning lights, egg production commenced in 4 weeks; with no lights, egg production commenced in about 11 weeks. Egg production was much greater in the two lighted pens than in the unlighted pen. Over twice as many poults were produced by each of the lighted pens than by the unlighted pens. There was practically no difference in egg and poult production between the two lighted pens. If electric lights are not available in your plant, try lanterns.

# INCREASE YOUR PROFITS

## FEED FOR VICTORY

## WITH ARCADY FEEDS

Answer the call for MORE EGGS and MORE POULTRY MEAT! Feed Arcady Feeds for Victory and for greater profits!

Arcady Poultry Feeds are the kind of feeds poultrymen are looking for to help them do their part for Victory.

You can always depend on Arcady Poultry Feeds for uniformity and good results. Also for the finest ingredients and dependable quality.

Remember, the emblem of 5 POINT PROTECTION on every bag of Arcady Feed is your assurance of QUALITY, LABORATORY-testing, FARM-proving, ample VITAMIN content and proper BALANCE.

## GET A SUPPLY
**FROM YOUR LOCAL**
## ARCADY DEALER

**ARCADY FARMS MILLING COMPANY**

**223 W. JACKSON BLVD., CHICAGO, ILL.**

## Liberal Feeding of Layers for Best Results

PARTIALLY starved hens cannot lay all of the eggs they are capable of laying. At the U. S. Southwest Poultry Experiment Station, Glendale, Arizona, 3 groups of White Leghorn pullets of the same breeding were fed and managed exactly the same except that group 1 had free access to feed at all times, group 2 was fed 87.5 per cent as much as group 1 consumed, and group 3 was fed 75.0 per cent as much as group 1 consumed. The results secured speak for themselves.

| Group | Amt. of Feed Fed | Ave. No. Eggs per. Hen Annually | Lbs. of Feed Consumed per Doz. Eggs | Feed Cost Per Doz. Eggs* (cents) | Profit above Feed Cost Per Hen** |
|---|---|---|---|---|---|
| 1 | Free access ..... | 182 | 4.4 | 13.2 | $1.79 |
| 2 | 87½% of Group 1 .... | 124 | 5.6 | 16.8 | .85 |
| 3 | 75% of Group 1 ..... | 88 | 6.8 | 20.4 | .34 |

Restricting feed consumption decreased egg production and increased the number of pounds of feed required to produce each dozen eggs. Feed cost per dozen increased and profit per hen decreased as feed consumption decreased. It simply does not pay to be stingy in feeding layers, especially if they are bred-to-lay.

*Feed cost $3 per 100 lbs. **Average egg price 25 cents a dozen

## More Wheat in Poultry Feeds

By HERBERT R. BIRD, *University of Maryland*

SINCE it has become a patriotic duty to use more wheat in poultry feeds, the question is often raised as to just how much wheat can be included satisfactorily in various types of formulas. Whole grain mixtures commonly contain 50% of wheat. For most purposes it would not be desirable to increase this figure very much, but it could be increased to 60 or 65% except in the case of birds being fattened for market.

Prior to the recent emphasis on the feeding of wheat, most mash feeds contained wheat bran and wheat middlings but no wheat. In such mashes all the middlings and all but 10% of the bran can be replaced by coarsely ground wheat. This generalization is a conservative one, but will usually permit the inclusion of 15 to 25% of wheat in the mash. It should be re-

*Poultry Experimental Plant, University of Maryland*

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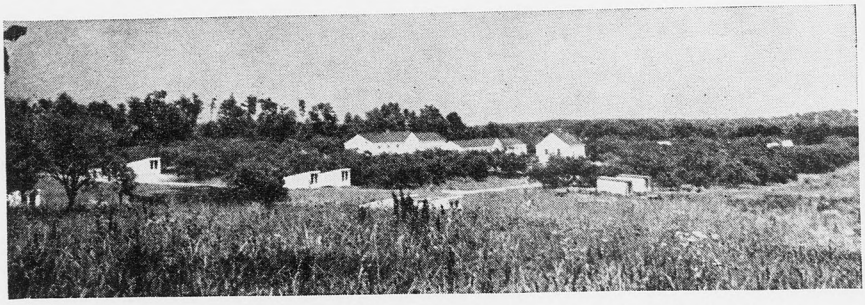

*Poultry Experimental Plant, University of Maryland*

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Rough, tough, and insoluble GRAN-I-GRIT in the gizzard grinds feed thoroughly . . . so that its valuable minerals, vitamins, and other nutritional elements can be more rapidly and more completely absorbed by the bloodstream. By thus preventing feed waste from undigested particles, GRAN-I-GRIT often pays for itself many times over. GRAN-I-GRIT also helps to prevent digestive disturbances indicated by diarrhea, cannibalism, cropbound condition, and certain forms of paralysis.

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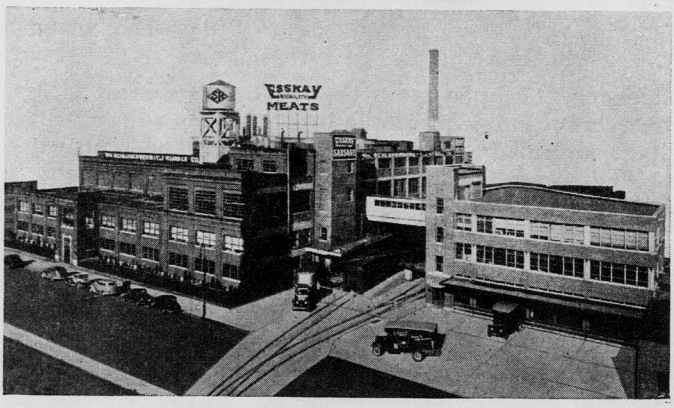


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SAUSAGE PRODUCTS ANIMAL AND POULTRY FOODS
TANKAGE, BLOOD MEAL, AND PLANT FOOD
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membered that bran and middlings contain 15 to 17% protein while wheat averages about 12%. Hence, an increase in soybean oil meal may be necessary when wheat replaces bran and middlings. If one desires to use still more wheat in the mash, he can begin to replace yellow corn but before doing this he should be sure that the resulting decrease in vitamin A potency of his mash will not endanger his success. The major contributors to vitamin A potency are alfalfa leaf meal and vitamin A and D feeding oils.

A discussion of wheat feeding would be incomplete without a warning against the feeding of new wheat not yet thoroughly dried. Every year there are reports from farms in this area of losses of birds due to the feeding of new wheat and new corn.

## High Feed Costs Versus Good Egg Prices What Do They Mean to You?

MANY poultry producers do not realize that they often make more profits when prices are high than when they are low.

Suppose that 100 pullets consume 25 pounds of feed and lay 4 dozen eggs daily and that feed costs $2.00 per 100 pounds and eggs sell for 25 cents per dozen. The returns above feed costs amount to 50 cents daily inas much as 25 pounds of feed cost 50 cents and the 4 dozen eggs sold for $1.00. The egg-feed ratio is expressed in terms of 8 dozen eggs being rerequired to pay for 100 pounds of feed. ($2.00 divided by 25 cents equals 8).

Now suppose that the same 100 pullets consume 25 pounds of feed and lay 4 dozen eggs daily but feed costs $3.00 per 100 pounds and eggs sell for 37.5 cents per dozen. The returns above feed costs amount to 75 cents daily inasmuch as 25 pounds of feed cost 75 cents and the 4 dozen eggs sold for $1.50. The egg-feed ratio is expressed in terms of 8 dozen eggs being required to pay for 100 pounds of feed. ($3.00 divided by 37.5 cents equals 8).

In both cases the feed-egg ratio is the same, but in the second case returns are greater because of higher prices. This is true in spit of the fact that the increase in feed cost was relatively the same as the increase in the selling price of eggs.

## Egg Weights per Dozen and per Case

| | Minimum average weight per dozen | Minimum weight, individual egg | Minimum net weight per case | Minimum gross weight per case |
|---|---|---|---|---|
| Large ..... | 24 ounces | 23 ounces | 45 pounds | 57 pounds |
| Medium ..... | 21 ounces | 20 ounces | 38½ pounds | 50½ pounds |
| Small ..... | 18 ounces | 17 ounces | 34½ pounds | 46½ pounds |
| Pee-Wee ..... | 16 ounces | 15 ounces | 30 pounds | 42 pounds |

## More Turkey Meat Being Consumed

The per capita consumption of turkey meat increased from 2.1 pounds in 1932 to over 3.6 pounds in 1941. Due to the pending shortage of beef and pork for domestic consumption, the per capita consumption of turkey meat will further increase in 1943.

# Hallcross Chicks . . .

**MAKE MORE MONEY**

***Because!***

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√ HALLCROSS have Hybrid vigor, low mortality and rapid, economical growth.

√ HALLCROSS breeding flocks have close supervision made possible by the hatchery's New England location.

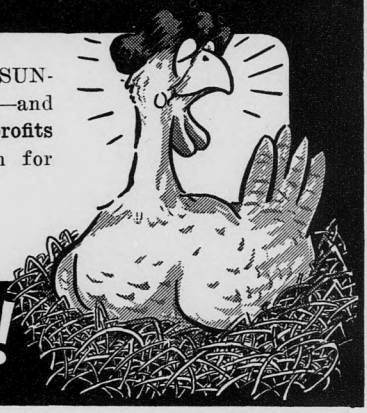
√ HALLCROSS are hatched from the cream of New England eggs, for which highest premiums are paid.

√ HALLCROSS are backed by Hall Brothers Hatchery, Inc., Wallingford, Connecticut.

*Rep. by—*

**J. R. EDDINGTON** **Federalsburg, Maryland**

**FROM THE START---**



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**HUBBARD MILLING CO.**

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**Dept. A MANKATO, MINNESOTA**

## Bred-to-Lay Stock and Skilled Management Boost Labor Income

In a study of factors affecting labor income in commercial egg production in the state of Washington, it was found that 9 factors were of greatest importance, for each of which is listed the average obtained from the 110 flocks:

| | | |
|---|---|---|
| 1 | Egg production per hen ..... | 148 eggs |
| 2 | Egg production per pullet ..... | 208 eggs |
| 3 | Fall egg production by hens ..... | 29 per cent |
| 4 | Fall egg production by pullets ..... | 57 per cent |
| 5 | Laying hen mortality ..... | 15 per cent |
| 6 | Laying pullet mortality ..... | 19 per cent |
| 7 | Size of flock ..... | 828 birds |
| 8 | Average price of eggs per dozen .... | 25 cents |
| 9 | Cost per dozen eggs (labor omitted) | 16 cents |

Labor income varied from 54 cents per bird in flocks that excelled in none or only one of any of these 9 factors to $2.03 per bird in flocks that excelled the average of from 7 to 9 factors.

| Number of factors in which flocks excelled | Average labor income per bird |
|---|---|
| 0-1 | .54 |
| 2 | .92 |
| 3 | $1.08 |
| 4 | 1.39 |
| 5 | 1.63 |
| 6 | 1.90 |
| 7-9 | 2 03 |

## Two Eggs in Fifteen for Lend-Lease

Out of every 15 eggs produced in the U. S. during 1942, two were dried to supply Lend-Lease needs. During 1942 between 4,200,000,000 and 4,500,000,000 dozen eggs were produced, of which about 6,000,000 were dried for shipment abroad. Three dozen shell eggs make one pound of whole egg powder. More dried eggs than ever will be produced in 1943.

## Hopper Feeding Space for Chicks and Layers

For about the first two weeks, 1 ft. double-side feeder for 20 chicks. Third through eighth week, 1 ft. double-side feeder for 10 chickens. From ninth week on, 1 ft. double-side feeder for 6 or 7 chickens. When scratch grain is fed in litter, 1 ft. double-side feeder for 10 layers. When all-mash diet is fed, 1 ft. double-side feeder for 6 or 7 layers.

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## DIGRASOL (DRY)

For a reliable, guaranteed source of the B-G vitamins for poultry, and hog feeds, proven in laboratory and field use —DI-GRA-SOL.

Yes, Sir, DI-GRA-SOL carries a positive guarantee of Riboflavin content and the cost is amazingly low! War needs demand feeds with **complete balance.** Vitamins of the B-G Complex are of great importance and MUST be supplied —Get them the simple, economical way— BUY DI-GRA-SOL! Will not cake or harden.

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**PROTEX MINERALS**
**Vitamin A & D**
**Feeding Oils**
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**Pro-Vim.....Hogger**
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**(SEMI-SOLID)**

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THE ATLANTIC SUPPLY CO. MARYLAND

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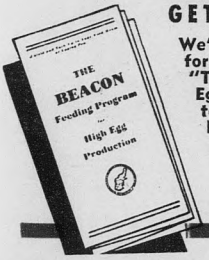


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Every single factor in your feeding is provided for—you can vary the amounts of grain, fleshing pellets and dry mash according to breed, age, season of the year and percentage of production. And there's no complicated routine . . . you'll find this easy-to-follow feeding plan so simple a novice can start right in using it.

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## UNJOINTED GRASSES

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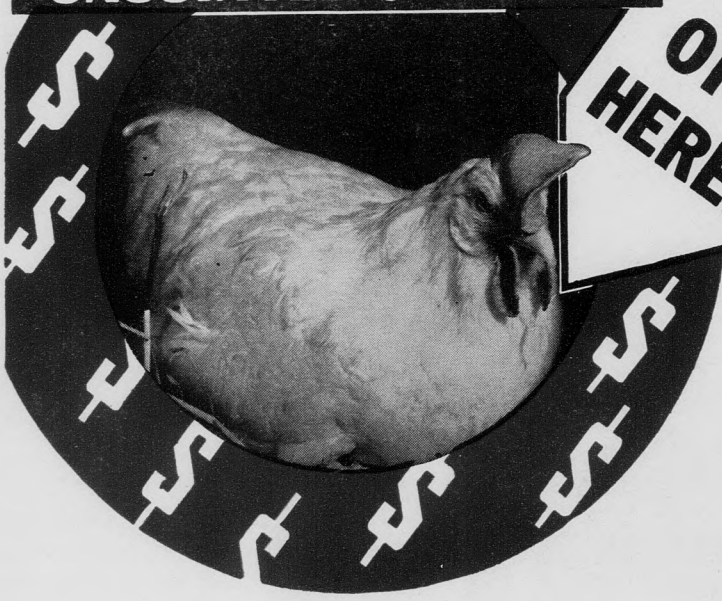

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A Cerogras Product bringing you the feeding values of Cerogras combined with Buttermilk. In dry form, Cerogras contains Cerograss and Buttermilk solids.

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**KANSAS CITY, MO.**

**Greenmelk**

Contains Cerogras blended with condensed Buttermilk.

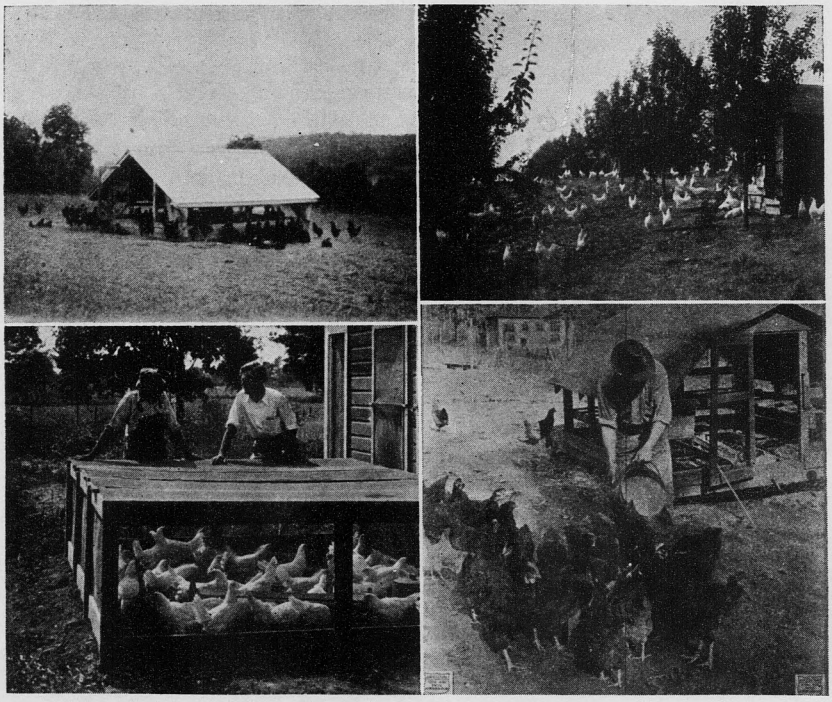
Already being used supplementally by many leading poultrymen.

## High Protein Diet Necessary for Efficient Growth

Here are the results secured when three different groups of cockerels were fed the same kind of diet except that the diet of the first group contained 13 per cent protein, the diet of the second group contained 17 per cent protein, and the diet of the third group contained 21 per cent protein.

| Per cent protein in diet ..... | 13 | 17 | 21 |
|---|---|---|---|
| Average weight of cockerels at 12 weeks, lbs. | 1.7 | 2.6 | 3.2 |
| Pounds of feed per pound gain in weight .... | 4.2 | 3.7 | 3.2 |

These results show clearly that during the first 12 weeks the diet containing 21 per cent protein was more efficient than diets containing 13 and 17 per cent protein.



Best pullets are usually grown on a clean range supplying abundant succulent green feed. Feed costs are lower and the pullets usually develop better than when confined. A sun porch with wire floor may be used for brooding during the first few weeks. Top left, Rhode Island Reds and their summer range shelter. Top right, White Leghorns being raised in an orchard. Bottom left, Leghorn pullets on a sun porch. Bottom right, New Hampshires on range. (Photos from U.S.D.A.)

## The High Cost of Mortality

By Morley A. Jull, *University of Maryland*

THE mortality that normally occurs among poultry flocks is one of the most important factors affecting profits. At the same time, very few flock owners have made any effort to determine the extent to which mortality has reduced profits in their flocks. Most flock owners seem to take for granted that a certain amount of mortality is to be expected. Mortality may

# CEROGRAS

## UNJOINTED GRASSES

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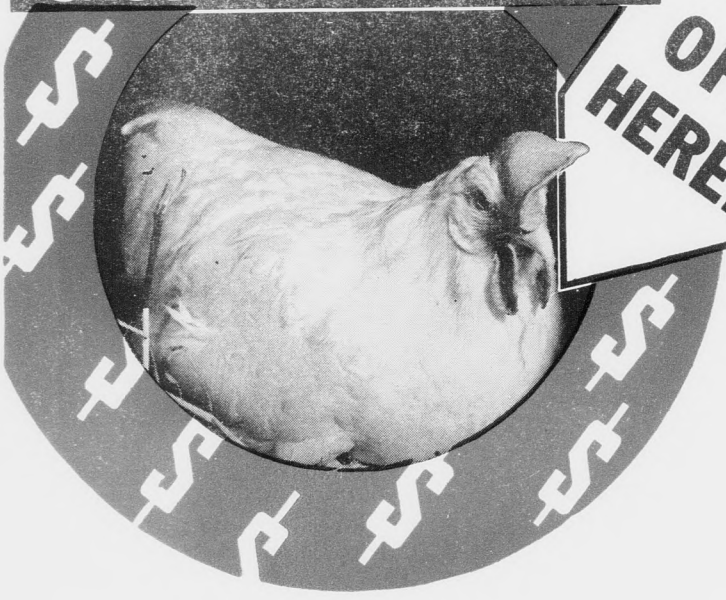

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vary from about 10 per cent to over 50 per cent. Many flock owners do not appreciate the eonomic importance of the difference between 10 per cent mortality and 20 per cent mortality. If more thought were given to the decrease in profits resulting from every 5 per cent increase in mortality in raising chickens or in keeping laying hens, more attention would be paid to practical measures in controlling mortality.

Broiler producers usually know the approximate number of chickens that die among the various flocks of broilers raised. The dead chickens are regarded as a loss but the fact is often overlooked that in cases of heavy mortality the survivors usually require more feed or take longer to reach the best market weight than survivors in a flock which has suffered relatively little mortality.

Among Indiana broiler flocks in which the average mortality was only 1.8 per cent, 4.1 pounds of feed on the average were consumed per pound of broiler produced. As mortality increased up to 21.9 per cent, the average number of pounds of feed per pound of broiler produced also increased. Broiler producers whose flocks suffered relatively heavy mortality had to buy more feed per pound of broiler produced than broiler producers whose flocks suffered relatively little mortality.

In producing broilers on a commercial basis in northwestern Arkansas, it has been shown that the amount of mortality to marketing time has a very important bearing on the net returns secured. It was found that a profit of 3.64 cents per pound was obtained from flocks having 10 per cent or less mortality. Flocks in which mortality ranged from 10.1 per cent to 20.0 per cent made a profit of 2.84 cents per pound. Flocks in which the mortality ranged from 20.1 to 30.0 per cent made a profit of only 0.80 cents per pound. On the other hand, flocks in which the mortality was over 30.0 per cent showed a loss of 1.20 cents per pound. The difference in net returns between the lowest and highest mortality flocks was 4.84 cents per pound.

Every flock owner realizes that as the mortality among growing chickens increases, the cost of raising the remaining pullets to laying age also increases.

Among Michigan flocks in which the mortality to 12 weeks of age averaged 7.0 per cent the net cost of raising the remaining pullets to laying age averaged 55 cents per pullet. On the other hand, among flocks in which the mortality to 12 weeks of age averaged 27.7 per cent the net cost of raising the remaining pullets to laying age was 65 cents per pullet. It may be well to point out that the later in life up to laying age that death occurs among pullets the greater is the loss involved with respect to feed and labor spent on the pullets. In other words, the death of 100 pullets at 4 months of age involves a much greater loss than as though those same pullets had died at 4 weeks of age.

The effect that laying flock mortality may have on the cost of producing eggs is shown in the following figures obtained from 276 Michigan poultry flocks. Among laying flocks in which the average mortality was 11 per cent the cost of producing eggs averaged 16 cents per dozen. When the laying flock mortality averaged 19 per cent the cost of producing eggs averaged 18 cents per dozen. When the laying flock mortality averaged 32 per cent the cost of producing eggs averaged 20 cents per dozen. Between flocks having the lowest mortality and those having the highest mortality the difference in the cost of producing eggs was 4 cents per dozen. When 4 cents per dozen is multiplied by the average number of dozen eggs laid per bird the sum becomes quite significant.

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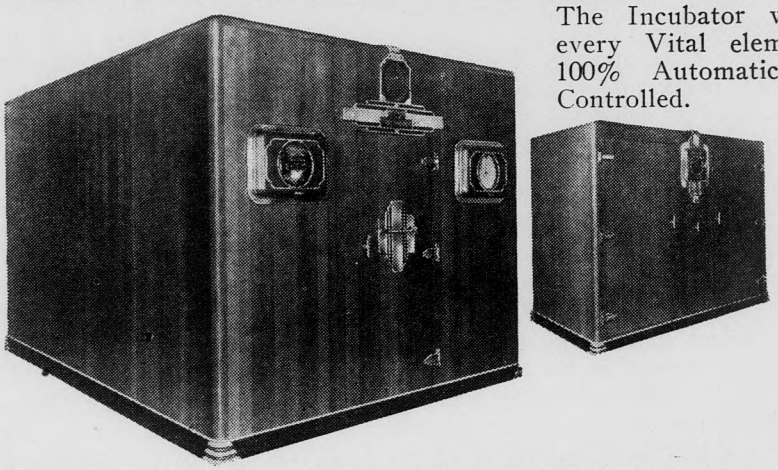

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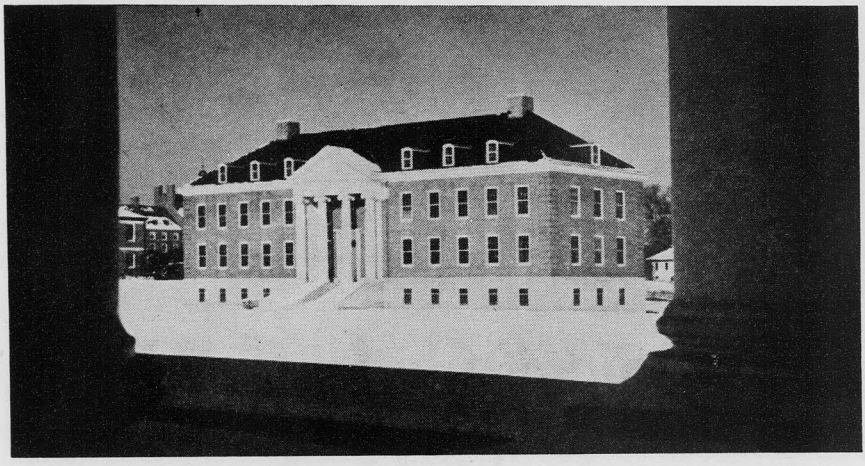
# The Maryland Experiment Station Performs Valuable Service for Poultry Producers

THE Experiment Station of the University of Maryland carries on a considerable number of research projects of practical importance to poultry producers. Most of the results secured from the experiments can be applied immediately to problems facing the industry.

The economic value of these results are worth many times what they cost. As a matter of fact, one of the best investments of public funds is the money spent on research the results of which enable poultrymen to produce eggs and poultry meat more efficiently, thereby increasing their profits.

Herewith are given in very brief form the results secured from some of the recent experiments carried on at the State Experiment Station.

*Viability of Barred Chickens*—The results secured from this experiment showed that crossbred progenies of Barred Plymouth Rock sires varied in viability directly with the viability of purebred progenies secured from the same sires. Cross-bred progenies suffered less mortality, grew faster, and feathered more quickly than purebred Barred Plymouth Rock progenies of the same sire in each



*Poultry Office and Laboratory Building, University of Maryland*

case. Pullets from one of the most viable Barred Plymouth Rock sires showed significantly greater viability in the laying house than pullets from any other of the purebred progenies. Pullets from the progeny showing the greatest brooding mortality also showed excessive laying house mortality. These results indicate that it is possible to breed for high viability.

*Vitamin D Losses in Stored Mixed Feeds*—The vitamin-D potency of fresh mixed mashes showed a decrease of from 20 to 50 per cent after three months' storage. Five sources of vitamin D were used, including 3 oils and 2 "dry" sources. There were no outstanding differences among them, although one of the oils seemed to show greater destruction than the others. These results may explain why some flocks suffer from rickets and produce soft-shelled eggs although fed mashes containing fish-feeding oils.

*Vitamin A Requirement of Breeding Stock*—As the result of studies on this problem it was found that breeding stock used in hatchery flocks to supply hatching eggs for hatcheries do not require any more vitamin A in their rations than laying stock kept for market egg production. When hens were fed vitamin-A-free diets, no decrease in hatchability occurred up to the time that egg production ceased be-

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cause of vitamin A deficiency. Groups of hens on different levels of vitamin A intake showed differences in egg production but no difference in hatchability.

*Riboflavin in Chick Nutrition.* Sources and Effect on Growth and Incidence of "Curled Toe" Paralysis—A large number of samples of various poultry feedstuffs were assayed for riboflavin, the growth-promoting vitamin. Thirteen samples of dried skimmilk averaged 20.6 micrograms per gram. There was relatively little variation among samples of these products. Five samples of dried whey varied in riboflavin content from 12.4 to 29.7 micrograms per gram. There was also considerable variation among skimmilk from the same plant, or between dried skimmilk and dried whey from the same plant. In experiments with chicks it was found that the addition of dried skimmilk to a flavin deficient diet resulted in a greater growth response per unit of flavin added than did the addition of crystalline riboflavin. The growth response per unit of flavin added was no greater when dried whey was fed than it was when crystalline riboflavin was fed. In some lots of chicks "curled toe" paralysis was not prevented by levels of riboflavin recommended for use in practical rations, indicating that the accepted figures for riboflavin requirement may need reinvestigation.

*Shank Pigmentation in Broilers*—Good shank color is important in selling broilers to advantage, especially alive. Excellent shank pigmentation was induced in 6, 8 and 10 weeks old Barred Rock x New Hampshire crossbred chickens in a period of ten days by feeding the following mash: ground yellow corn 51, ground oats 10, flour middlings 10, alfalfa leaf meal 5, corn gluten meal 16, dried skimmilk 5, salt 0.5, steamed bone meal 1.0, and oystershell flour 1.5. A ten-day period was sufficient to change the shanks from cream-color to a deep yellow or orange-yellow. It was also found that there is apparently something in meat and bone meal that tends to depress pigmentation.

*Soybean Oil Meal in Poultry Rations*—A prospective 100 per cent increase in soybean oil meal supply, coupled with shortages of meat meal and fish meal, calls for increasing levels of soybean oil meal in poultry feeds. Moreover, this is a matter of economy because plant proteins are relatively less expensive than animal proteins. Nine lots of broilers were grown satisfactorily on a mash containing 24.5 parts of soybean oil meal. The mash also contained 4 per cent menhaden meal, which can be replaced by the same amount of skimmilk, it was found. As much as one-half of the soybean oil meal can be replaced by corn gluten meal.

*Early Selection of Breeding Stock*—Rapidly growing chickens ate less feed daily per unit of live weight and used their feed far more efficiently than slow growing chickens. Variability in rate of growth was found to be due to differences in (1) efficiency of feed utilization, (2) appetite due to energy requirement, (3) inherited adult body size. Variability in rate of growth increased from hatching time until it was relatively greatest at about 4 weeks of age, after which it decreased at the same rate until about 10 weeks of age, then more slowly until the birds reached maturity. These results indicate clearly that birds to be used for future breeding purposes should be selected first at about 4 weeks of age, then again about 10 or 12 weeks of age, and a third time at about 16 to 20 weeks of age. Rate of growth and efficiency of feed utilization are very important factors determining profits in poultry production.

*The Feed Cost of Egg Production*—Rate of egg production is the most important factor in determining the feed cost of producing eggs. Hens which lay no eggs use all the feed they eat just to keep themselves alive and warm. This feed for maintenance returns no profit. It varies from 45-85 pounds per bird per year or from 14-21 pounds per hundred birds per day, depending on the weight of the birds. Each 2 ounce egg produced requires about two and one-fourth ounces of feed in addition to that required for maintenance. Obviously, the higher the rate of egg

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production, the smaller becomes the amount of feed eaten for maintenance which must be paid for by one egg.

A flock of 4 pound Leghorns averaging 100 eggs per bird per year or laying at the rate of 27.4 eggs per hundred birds per day will eat about 8 pounds of feed for every dozen eggs produced. On the other hand, a flock averaging 250 eggs per bird per year or 68.5 eggs per hundred birds per day requires only about 4½ pounds of feed for each dozen eggs produced.

## Proper Brooder Temperature Very Important

FOR the first few days, the temperature should be 95° F. to 100° F. at about two inches above the floor and then the temperature should be lowered about 5 degrees each week, depending upon the time of the year and the outside temperature.

The temperature of the brooder house should be about 70° F. It is quite important not to have the brooder house too warm. Chicks will do better in a fairly cool room providing the right temperature is maintained under the brooder so that the chicks will go to get warm whenever necessary.

It is most important to see that the chicks spend the first night or two under the hover since this teaches them to go under the hover later when they require warmth. For the first two or three nights, visit the brooder just as the chicks are going to sleep and tuck them under the hover.

The main point in brooding is to maintain the temperature in the brooder house that will keep the chicks comfortable at all times. Excessive heat causes the chicks to pant and may even cause them to crowd into the corners of the brooder house in an attempt to get away from the brooder. On the other hand, too low a temperature will cause the chicks to huddle either under the hover or in the corners of the brooder house. If the chicks are comfortable at night, they will spread out evenly under the hover of the brooder and some of them may have their heads protruding from under the canopy.

The most critical period in brooding is the first two weeks, so that the most careful attention should be given the brooder during this time. The temperature is controlled by adjusting the thermostat, or, in the case of some electric brooders, by raising or lowering the brooder.

In the case of brooders with hovers or canopies that have drop curtains around the sides, it is important to realize that at night when the chicks are under the hover they generate considerable heat from their bodies, whereas in the daytime, only a few chicks are under the hover at any one time so that less body heat is generated. It is very important to see that the proper temperature is maintained under the hover throughout the day.

When the chicks are well feathered, they require little heat. Chicks brooded during the winter months may need a little heat up to about the eighth week, but during the spring season, particularly if the weather is warm, heat may be dispensed with after about five weeks.

Poor feathering sometimes results from maintaining too high a temperature in the brooder house, especially if coal- or wood-burning brooder stoves are used.

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Reflect for a moment what it means to run a business continuously for 116 years . . . through many panics . . . depressions . . . and wars, without going on the rocks at any time. Luck and good fortune have been with us . . . we have always had very capable and broadminded business men at the head of our organization, and today, our house is capably managed by the second and third generations of the Hunters' and Waltons', with the assistance of other partners, bright and active young men who were formerly employees of the firm. We have always been fortunate in having loyal and capable employees, and perhaps we hold the record for employee permanence.

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## Utilizing Poultry Manure for Fertilizer

ALL sources of nitrogen should be carefully conserved, especially for the duration. Poultry manure is one of the most common nitrogenous fertilizers available for farmers and when cared for intelligently is much richer in nitrogen than other farm manures.

Adding 2 pounds of superphosphate daily to the droppings of 100 hens tends to prevent the loss of ammonia and helps to make a better balanced fertilizer by supplying phosphorus.

One ton of fresh poultry manure contains at least 20 pounds of nitrogen, 16 pounds of phosphoric acid, 8 pounds of potash, and 500 pounds of humus. This gives a formula of 10-8-4 as fertilizer formulas are usually expressed. When superphosphate is added at the rate suggested above, the formula becomes 10-20-4. Part of the nitrogen of poultry manure is liberated in the soil rather quickly while the rest is liberated slowly. For this reason poultry manure is a valuable fertilizer for various crops. However, because of the possibility of spreading disease, chickens and turkeys should not have access to fields on which they ranged the previous year nor on land recently fertilized with poultry manure.

One hundred hens in a year produce approximately 3.5 tons of fresh manure; 200 broilers in 12 weeks produce about one ton; 100 young turkeys by Thanksgiving produce about 4 tons.

## Do You Have 100-Egg or 180-Egg Birds?

MANY flocks in the country lay an average of about 100 eggs per bird during their first laying year. Many other flocks lay an average of about 180 eggs per bird. In the table below are given the number of eggs laid per month by a 100-egg and a 180-egg hen. The farm price per dozen, given in the second column from the left, is the average monthly price from October 1939 to September 1940 received by farmers throughout the United States as determined by the United States Department of Agriculture.

| Month | Farm Price per doz. | 100-egg bird | | 180-egg bird | |
|---|---|---|---|---|---|
| | | No. eggs laid | Value | No. eggs laid | Value |
| Oct. ..... | 22.9 | 0 | 0 | 13 | 24.8c |
| Nov. ..... | 25.8 | 2 | 4.3c | 13 | 27.9 |
| Dec. ..... | 20.5 | 4 | 6.8 | 15 | 25.6 |
| Jan. ..... | 18.3 | 8 | 12.2 | 15 | 22.9 |
| Feb. ..... | 20.2 | 10 | 16.8 | 14 | 23.6 |
| Mar. ..... | 15.4 | 15 | 19.2 | 17 | 21.8 |
| Apr. ..... | 15.0 | 17 | 21.2 | 18 | 22.5 |
| May ..... | 15.1 | 15 | 18.9 | 17 | 21.4 |
| June ..... | 14.4 | 12 | 14.4 | 16 | 19.2 |
| July ..... | 16.4 | 9 | 12.3 | 15 | 20.5 |
| Aug. ..... | 17.2 | 6 | 8.6 | 14 | 20.1 |
| Sept. ..... | 21.0 | 2 | 3.5 | 13 | 22.8 |
| Total ..... | | 100 | $1.38 | 180 | $2.73 |

The eggs laid by 180-egg bird were worth $1.35 more than the eggs laid by the 100 egg bird. Note particularly that the 180-egg bird laid relatively more eggs during the season of high egg prices.

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## Plenty of Water Very Important

Provide at least one quart of water for every 40 chickens during the first 2 weeks, one quart for every 20 chickens from 3 to 8 weeks, and one quart for every 10 chickens after 8 weeks.

The daily requirements of 100 layers are about 6 gallons. Two 3-gallon containers are better than one 6-gallon container.

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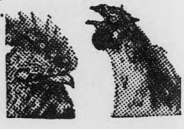

**WENE POULTRY LABORATORIES**
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# Poultry House Dim-outs and Blackouts

TO conform to regulations of the Civilian Defense Program, Maryland poultrymen must provide facilities for lighting their poultry houses in conformity with orders prevailing in their area as follows:

1. In Wicomico, Somerset and Worcester counties lights in poultry houses must be permanently dimmed out.

2. When blackouts are ordered in any part of the State, poultry house lights must be either turned off or the windows and openings must be made light proof.

On the basis of preliminary tests made at the Poultry Department of the University of Maryland, the following recommendations are proposed:

**Dim-outs:** Since the dim-out period extends from ½ hour after sunset to ½ hour after sunrise, all lights must be permanently dimmed out. In broiler and laying houses this is easily accomplished as follows: A 5 quart oil can (available at most auto service stations) with one end removed with a can opener, makes a satisfactory shield to deflect light down on the floor. The other end should have a round hole cut in the center just large enough to admit the screw portion of bulb and remain fixed when bulb is screwed in socket.

For laying houses, a slot 3 inches high and 5¼ inches wide is cut in lower end of can to throw light back on the roosts. Any light reflected through upper part of bulbs to the ceiling above must be covered to stop such light. The reflectors must be so placed that no bright light is reflected through the windows or openings in order to meet the dim-out requirements. Windows on the side of the house facing the ocean must be blacked out.

Baffles of boards, burlap, etc., in front of lights to stop direct light passing out windows or openings may be used, but reflectors as described are more satisfactory.

In the reflectors described, 2 lights using 25 watt bulbs furnishes adequate illumination for the average room (up to 24 ft. x 24 ft.) for part time lighting; where all night lights are used, 15 watt bulbs will provide adequate illumination.

**Blackouts:** For complete blackouts, poultrymen have three alternatives from which to choose:

1. Using morning and evening lights (part time illumination), and cutting them off during raid alarms.

2. Employ all morning lights (4 a.m. till light) when air raids or alarms are much less likely to occur. However, provision must be made to cut off all lights in the event of an alarm during lighting hours.

At present under infrequent practice blackouts, this is the most practical procedure for Maryland poultrymen outside the dim-out areas.

3. Employ the lighting schedule best suited to one's conditions, and provide curtain facilities to blackout all windows and openings to prevent interruption of lighting schedule.

This has not yet become necessary, but the possibility of serious losses of egg production or growth in broilers on large poultry establishments should air raids or alarms become frequent, is a matter which should not be ignored.

Detailed plans of an economical and permanent dim-out light fixture as well as for blackout curtains in poultry houses have been designed and are available upon request from the Poultry Department, University of Maryland. Any question which may arise concerning your own dim-out or blackout facilities should be submitted to your local Civilian Defense officials.

WADE H. RICE
University of Maryland

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## A Well Insulated Laying House Necessary for Best Results

DURING the winter months, when the outside temperature frequently fluctuates greatly, the inside of the house is apt at times to be very cold and damp. When the wind is not blowing, it is necessary to have a difference of temperature inside and outside the house in order to have air circulation inside. For this purpose the house must be properly insulated. Insulating the roof is particulary important in all parts of Maryland.

The proper insulation of the walls and roof of a laying house serves the following purposes:

1. In cold weather heat is conserved so that the birds require less feed and are kept more comfortable.

2. In hot weather, the inside temperature is considerably cooler, thus keeping the birds in greater comfort.

3. The house temperature varies less from day to day than in an uninsulated house, thus promoting better egg production.

4. Insulation establishes a greater difference in temperature between the inside and outside of the house. This promotes better circulation of inside air and gives better ventilation with the result that the house is drier than when there is no insulation.

A house sheathed with a rigid insulation board has greater structural strength than a house sheathed with tongue-and-groove lumber.

One method of insulating the walls of the house is to use ordinary sheathing on the inside with building paper next to the studs. Still more effective insulation is secured if the space between the outside wall and the sheathing is tightly packed with shavings. There are several composition insulating materials on the market that are satisfactory for insulating walls but some of them must be protected so that chickens cannot pick them.

The best material for insulating the roof is probably insulation board. A straw-loft house, where the gable portion is filled with straw supported by one inch wire netting, provides for good roof insulation. The straw should be from 12 to 18 in. deep, and at the ends of the house above the straw there should be ventilators to allow air to pass out from above the level of the straw.—Morley A. Jull, University of Maryland.

## Multiple Testing and Low Maximum Tolerance Very Necessary in Eradicating Pullorum Disease

THE importance of securing chicks from hatcheries carrying on a pullorum-testing program under official state supervision cannot be emphasized too strongly. Chicks infected with the organism that causes pullorum disease may suffer as much as 50 or 60 per cent mortality.

Under the supervision of the Ohio Poultry Improvement Association a very active campaign has been carried on to reduce the amount of pullorum infection among hatchery flocks supplying eggs to members of the association. During the 1938-1939 hatching season some of the flocks had not more than 2 per cent reactors, some not more than 5, some not more than 7, and some flocks had not been tested previously. Prior to the 1939-1940 hatching season these flocks were tested. In Table 1 are given the per cent reactors found in the different groups of flocks

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based on the maximum per cent of reactors in the flocks the previous year. The same procedure was followed prior to the 1940-1941 hatching season, the data also being given in Table 1.

Table 1. Per Cent Reactors in Flocks One Year Based on Maximum Per Cent Reactors in Same Flocks the Previous Year

| Hatching season | Max. per cent reactors prev. yr. | Number of flocks tested | Number of birds tested | Per cent reactors |
|---|---|---|---|---|
| 1939-1940 | 2 | 329 | 96,350 | 0.8 |
| | 5 | 285 | 68,144 | 2.1 |
| | 7 | 2034 | 422,682 | 3.7 |
| | Not previously tested | 646 | 116,703 | 5.8 |
| 1940-1941 | 2 | 566 | 143,274 | 1.3 |
| | 5 | 1308 | 266,843 | 3.0 |
| | 7 | 1642 | 330,078 | 3.7 |
| | Not previously tested | 1319 | 248,518 | 5.5 |

The data in Table 1 show quite clearly that the lower the maximum per cent reactors one year, the lower the per cent reactors the next year. All hatchery flocks that have over 2 per cent reactors should be retested until the per cent reactors is reduced below 2 per cent. Many flock owners whose flocks show a high percentage of reactors would be well advised to secure chicks from **U. S.** Pullorum-Passed or **U. S.** Pullorum-Clean Flocks.

Chick mortality during the first 3 weeks was studied in relation to the maximum per cent reactors in flocks prior to the hatching season for the 2 and 5 maximum per cent groups. Comparable data are given in Table 2 on groups of birds tested by the stained-antigen, rapid, whole-blood test.

Table 2. Per Cent Three-Week Chick Mortality in Relation to Maximum Per Cent Reactors in Flocks Prior to Hatching Season

| Max. per cent reactors in hatchery flocks prior to hatching season | Per cent chick mortality, 3 weeks | | | | |
|---|---|---|---|---|---|
| | Wh. Leg. | B. P. Rock | W. P. Rock | N. Hamp. | W. Wyand. |
| 2 | 2.43 | 3.42 | 3.35 | 1.71 | 4.27 |
| 5 | 3.46 | 3.22 | 4.26 | 4.27 | 3.71 |

The results given in Table 2 show that, for the most part, flocks in which there was not over 2 per cent reactors prior to the hatching season produced chicks in which three-week mortality was lower than among chicks secured from flocks in which there was not over 5 per cent reactors prior to the hatching season.

Hatchery flocks having 2 per cent or more reactors at time of testing should be repeatedly tested at not less than 30-day intervals until the flock contains less than 2 per cent reactors.

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## New Poultry Staff Member

Dr. R. E. Phillips joined the poultry staff of the University of Maryland January 1, 1942. Dr. Phillips is a graduate of the Kansas and Iowa Colleges of Agriculture and is trained especially in poultry physiology. He has done excellent research work at both of these institutions and at the University of Maryland is conducting research on problems of egg production, reproduction, hatchability and on factors affecting the quality of eggs and poultry meat. Dr. Phillips is a valuable addition to the University staff.

## Poultry Department Keeps in Touch with Industry

Staff members of the Poultry Department of the University of Maryland make personal contacts with over 1500 poultry producers in Maryland annually.

## Westminster Cooperative Auction Sales Bring Top Prices

PRICES secured by the Westminster Cooperative Poultry Auction, compared with the top Baltimore market quotation for products of similar grade, indicate that the auction is doing an efficient marketing job for poultrymen of Carroll and adjacent counties.

In the following table the auction prices given for poultry are the top prices received for heavy colored broilers and heavy colored fowl on the date of sale nearest the first and fifteenth days of each month. The Baltimore quotation opposite each is the top quotation as reported by the Maryland Department of Markets for heavy crossbred (colored) broilers, and heavy (colored) fowl on the same date.

The egg prices shown are for large white, fancy and Grade A eggs at Westminster on sales days nearest the first and fifteenth day of the month. The Balti-

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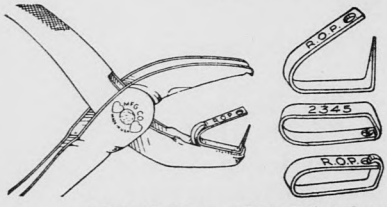


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more quotation opposite is the highest quotation for nearby large whites (including street sales) on the same dates as Westminster sales.

All prices shown include the usual commissions charged on the Baltimore market for the Baltimore quotations and also the sales costs (pool deductions) for the Westminster prices.

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| | 1941 | | | | | | |
| | Auction | Balto. | Auction | Balto. | Auction | | Baltimore |
| November | 20 | 21 | 21½ | 22 | 49 | 47½ | 42½ |
| | 22 | 21 | 24 | 21 | 51 | 48½ | 43 |
| December | 19 | 19 | 23½ | 21 | 44¼ | 39¾ | 41 |
| | 21½ | 20 | 22 | 21 | 44¾ | 43½ | 39½ |
| | 1942 | | | | | | |
| January | 17¾ | 22 | 21¼ | 23 | 38¼ | 36 | 39 |
| | 21 | 22 | 23¼ | 24 | 40 | 38½ | 36½ |
| February | 19¼ | 23 | 21¼ | 21 | 36½ | 35 | 36½ |
| | 23¾ | 23 | 24½ | 24 | 33½ | 31 | 31½ |
| March | 20½ | 22 | 25 | 24 | 31½ | 29 | 29¼ |
| | 22¼ | 23 | 26½ | 23 | 32 | 30 | 28½ |
| April | 24¾ | 23 | 23¾ | 24 | 34¾ | 32 | 29½ |
| | 23¼ | 23 | 25¼ | 24 | 35 | 32¼ | 29 |
| May | 25½ | 23 | 24 | 23 | 34½ | 32¾ | 30 |
| | 26½ | 23 | 27 | 23 | 34 | 32½ | 29½ |
| June | 31 | 26 | 24 | 24 | 35¾ | 34½ | 32½ |
| | 26 | 26 | 23½ | 24 | 37 | 35¾ | 33½ |
| July | 27½ | 27 | 23 | 23 | 42 | 40 | 34 |
| | 27 | 27 | 26 | 24 | 42¼ | 41½ | 37 |
| August | 28 | 28 | 24 | 24 | 44½ | 44 | 38 |
| | 29½ | 31 | 23 | 24 | 50 | 48 | 40 |
| September | 30 | 29 | 29 | 24 | 52 | 49¼ | 42 |
| | 34 | 29 | 26 | 26 | 56½ | 53½ | 44 |
| October | 28½ | 26 | 24½ | 26 | 57½ | 56 | 46 |
| | 31 | 27 | 27 | 25 | 60 | 59½ | 46 |

## Economic Factors in Broiler Production

By Morley A. Jull, *University of Maryland*

MOST broiler producers start too many chicks per stove. Overcrowding increases mortality, retards growth, and often causes poor feathering. Too many broiler producers operate on the basis of **volume** instead of quality of broilers raised. Raising fewer broilers per stove would mean fewer pounds of feed per pound of broiler raised and would produce better quality birds. Raising a higher percentage of broilers of superior quality would increase the labor income per pound of broiler raised.

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quite rapidly, doubling their weight approximately every two weeks up to about six weeks. With this in mind, it is easy to understand why chicks become badly overcrowded if too many are placed under the brooder at the start. The smaller the number of chicks as a unit, the greater the cost of brooding per chick. On the other hand, the larger the number of chicks brooded as a unit, usually the slower the growth and the greater the mortality.

Under usual conditions of brooding, mortality is greatest during the first two weeks of the brooding period. In a two-year survey of commercial broiler raising in Maryland the following percentages of mortality occurred: first two weeks, 6.3; third through fifth week, 4.2; sixth through eighth week, 2.8; ninth through twelfth week, 1.4.

In a two-year study of commercial broiler raising in Indiana in 1936 and 1937 it was found that the larger the number of chicks started per brooder the greater was the mortality.

Not only was there much less mortality among chicks brooded in lots of 250 chicks or less than among chicks brooded in larger sized lots but it was also found that fewer pounds of feed were required per pound of broiler produced in the smallest lot as compared with larger lots.

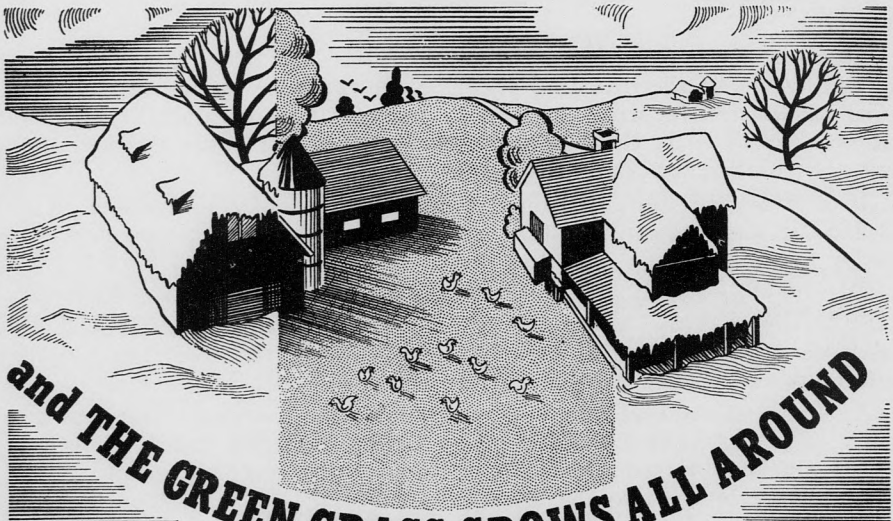
Age and Weight of Broilers at Selling Time.—The ability to grow rapidly is of the utmost importance in determining the relative profitableness of chickens raised as broilers. Rapid-growing chickens utilize their feed more efficiently than slow-growing chickens. In addition, the sooner that broilers reach the best market size, depending upon the price of broilers of different sizes, usually the greater the profits. It is true, of course, that the longer that broilers are kept the more pounds of feed required to produce each successive pound increase in weight but prices for large broilers are frequently sufficiently high enough to make it relatively profitable to produce them. The profit obtained per bird or per pound in relation to the age at which broilers were sold by Arkansas and Delaware producers were found to be as follows:

| Age in weeks at selling time ..... | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|
| **Arkansas, 1938-1939** | | | | | | |
| Average weight per bird, lbs. ..... | 2.9 | 3.1 | 3.2 | 3.3 | 3.4 | 3.6 |
| Average profit per bird, cents ..... | 5.0 | 3.9 | 8.6 | 9.0 | 9.2 | 9.0 |
| Average profit per pound, cents ..... | 1.8 | 1.3 | 2.7 | 2.7 | 2.7 | 2.5 |
| **Delaware, 1939** | | | | | | |
| Average weight per bird, lbs. ..... | 2.8 | 2.9 | 3.0 | 2.9 | 3.0 | |
| Average profit per bird, cents ..... | 7.1 | 4.9 | 5.3 | 4.7 | 5.6 | |

These figures indicate that in Arkansas relatively greater profits per bird and per pound were made from broilers sold at 14 to 17 weeks of age than when sold at 12 or 13 weeks of age.

In Delaware the greatest profit per bird was made from broilers sold at 12 weeks. The principal reason why the older broilers did not make better profits than indicated was because of relatively slow growth. Broilers sold at 15 weeks weighed the same as broilers sold at 14 weeks. As a matter of fact, broilers sold at 16 weeks only weighed one-fifth of a pound more per bird than broilers sold at 12 weeks.

The Arkansas and Delaware figures indicate that commercial producers



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in these states aim to sell their broilers when they attain approximately 3 pounds on the average.

The average profit per pound of broiler produced in Indiana, 1936-1937, and per bird in Maryland, 1934-1936, in relation to the average weight per bird at selling time was as follows:

| Average weight per bird at selling time | Under 2.5 | 2.25-2.49 | 2.50-2.74 | 2.75-2.99 | 3.00 or over |
|---|---|---|---|---|---|
| Indiana, average profit per pound .... | 3.0 | 1.4 | 4.5 | 4.7 | 4.2 |
| Maryland, average profit per bird .... | -2.0 | -5.1 | 4.2 | 7.6 | 13.5 |

These figures indicate that there is greater profit per bird and per pound of broiler produced by producing broilers weighing at least 2.50 pounds on the average. During recent years the production of broilers weighing at least 3 pounds each have usually produced the greatest profits.

Labor.—The amount of labor used per 100 broilers raised or per 100 pounds of live broilers up to selling time varies according to the total number of broilers cared for per person, the organization of the broiler plant, labor saving conveniences, the relative amount of time spent on details, and other factors.

In Arkansas an average of 3.4 hours was spent per day per 1000 broilers started. Lots of less than 2000 required an average of 3.7 hours per day per 1000 and lots of over 4000 required an average of 2.7 hours per day per 1000. The value of labor to raise broilers to selling time amounted to an average of $49.00 per 1000 broilers.

In Delaware in 1939 the cost of labor per 1000 chicks purchased amounted to $14.05. The net profit per 1000 chicks purchased was $53.97 so that the labor and management returns amounted to $68.02 per 1000 chicks purchased.

In Indiana the average labor requirement during the first 12 weeks was approximately 15 hours weekly per 1000 chicks started. After the twelfth week the sale of broilers meant less labor for the balance of the lot. It was further found that an average of 259 hours of labor was required to raise 1000 pounds of broilers. Raising 1000 or less broilers required an average of 327 hours per 1000; raising between 1001 and 2000 broilers required an average of 233 hours per 1000; raising over 2000 broilers required an average of 228 hours per 1000. An average of 94 hours was required to produce 1000 pounds of broilers. Deducting all costs except labor from total returns showed that the average returns per hour of labor were 66 cents in 1936 and 51 cents in 1937.

In Maryland the value of labor in raising broilers amounted to $39.80 per 1000 birds. Broiler farms with an average of over 13,000 birds had a labor expense of less than 3 cents per bird while farms with an average of less than 5000 birds had a labor expense of over 9 cents per bird. As the labor expense per bird increased the profit per bird decreased. When the labor expense amounted to over nine cents per bird broilers were produced at a loss of 5 cents per bird.

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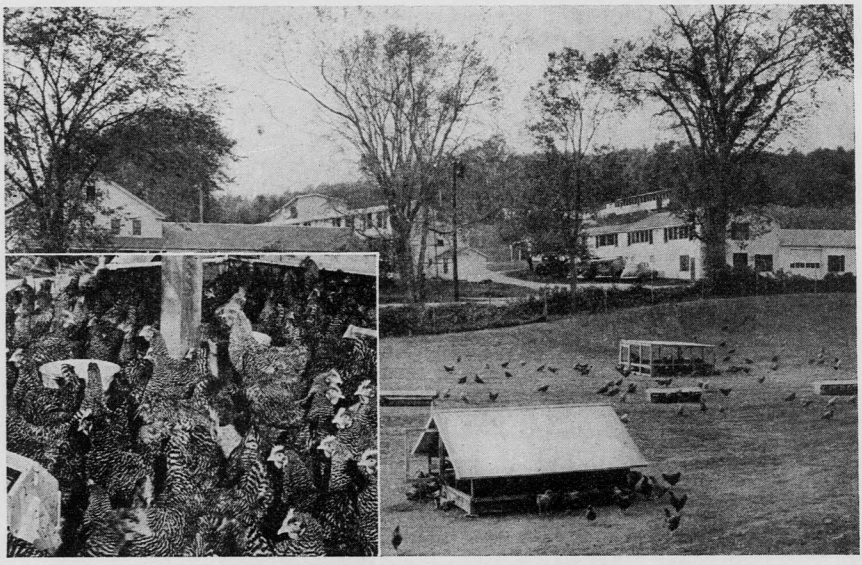

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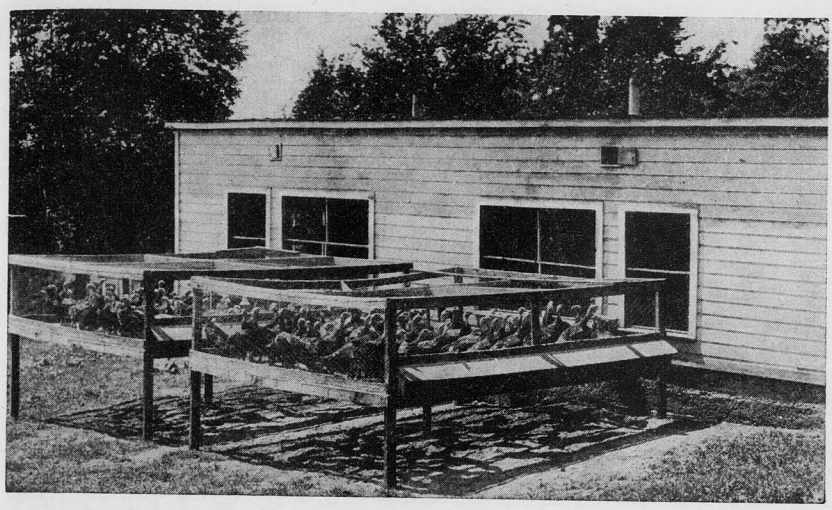

Brooding turkey poults on wire sun porches for the first ten or twelve weeks then moving them to a good growing range is a practice increasing among turkey growers.

## Artificial Lighting for Increased Profits in Egg Production

ARTIFICIAL illumination in laying houses is used by many flock owners for one of the two following purposes: (1) To increase fall and early winter egg production among pullets. (2) To maintain good egg production in the late summer and early fall among yearling hens.

Egg prices are usually higher during the late summer and early fall months than at any other time of the year. Therefore, it is desirable for the flock owner to secure as many eggs as possible during the summer and fall months. This can be accomplished to a considerable extent by using artificial illumination both in the case of pullets and yearling hens.

In order that the birds may derive the greatest benefit from the use of artificial illumination, the proper kind of lighting system must be installed. For each 200 square feet of floor space in the laying house there should be one 40-watt Mazda lamp with a cone shape reflector 16 inches in diameter by 4 inches high. The reflecting surface of the reflector should be covered with three coats of bronze or aluminum paint. The lighting units should be 6 feet from the floor and 10 feet apart midway between the front of the house and the front of the droppings board or pit. Since each lighting unit provides illumination for 200 square feet of floor space, it is a simple matter to determine the number of units necessary by dividing the floor area of any particular house by 200. The nearest whole number gives the number of lighting units required. A house with a floor area of 400 square feet needs 2 lighting units each 10 feet apart and 5 feet from each end of the house. A house with a floor area of 750 square feet needs ($750 \div 200 = 3.75$) 4 lighting units each 10 feet apart and the end units 10 feet from each end of the house.

Proper, safe, and adequate wiring is essential. Apparently the best kind of wiring is non-metallic sheathed cable (Rome X, Braid X or similar kind of material). The wiring should be safe from the standpoint of avoiding

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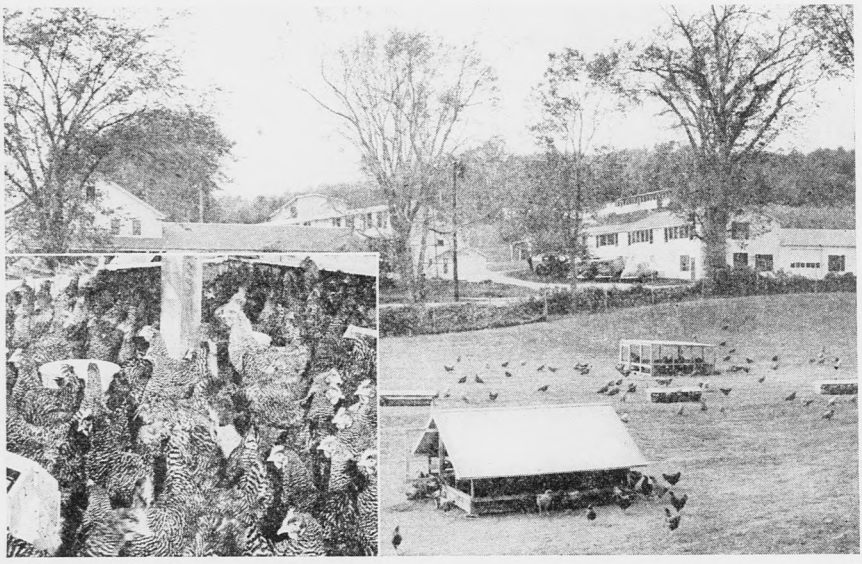

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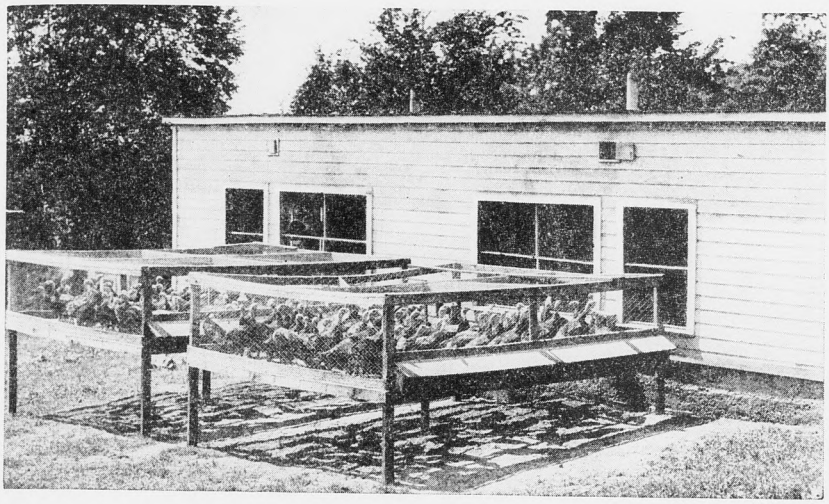

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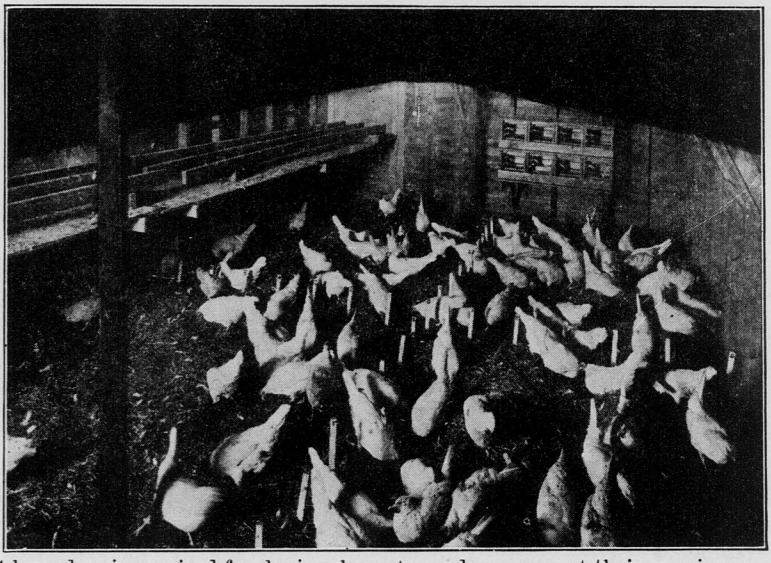
Proper, safe, and adequate wiring is essential. Apparently the best kind of wiring is non-metallic sheathed cable (Rome X, Braid X or similar kind of material). The wiring should be safe from the standpoint of avoiding

injury to persons and loss of property. The installation of the lighting equipment should comply with the regulations of the National Board of Fire Underwriters and should be able to pass inspection as called for in the National Electrical Code. The wiring should be adequate so that there will not be an excessive drop in voltage, otherwise the lighting system will give unsatisfactory service. Wire sufficiently large to carry the load and not give rise to more than 2 per cent drop in voltage is necessary for satisfactory service.

The lighting system should be operated so as to give about a 14-hour day for the layers.

The lighting system most widely used consists of using morning lights only because it is simpler and at dusk the day's work is done. The flock owner can attend to anything in the house in the evening as soon as the birds have gone to roost. Also, no dimming system is necessary. It is very important to give the birds practically the same amount of artificial light and daylight from day to day. Failure to turn the lights on a few mornings may cause a drop in egg production.—Morley A. Jull, University of Maryland.



A 14-hour day is required for laying hens to produce eggs at their maximum capacity. This makes artificial lighting necessary from September through March if profitable egg production is to be secured. Two 40-watt bulbs 6 feet above floor is standard equipment for the average laying room. (Photo from Cornell University)

## Characteristics for Profitable Egg Production

By Morley A. Jull, *University of Maryland*

WHAT characteristics must a bird possess that will enable her to lay at least 150 eggs per year? An average production of 150 eggs per bird is necessary for reasonable profits. The ability to lay well is inherited. Neither the best kind of diet nor the most scientific management will enable pullets to lay well if they are not bred for egg producion. A pullet to lay well should possess the following four outstanding characteristics:

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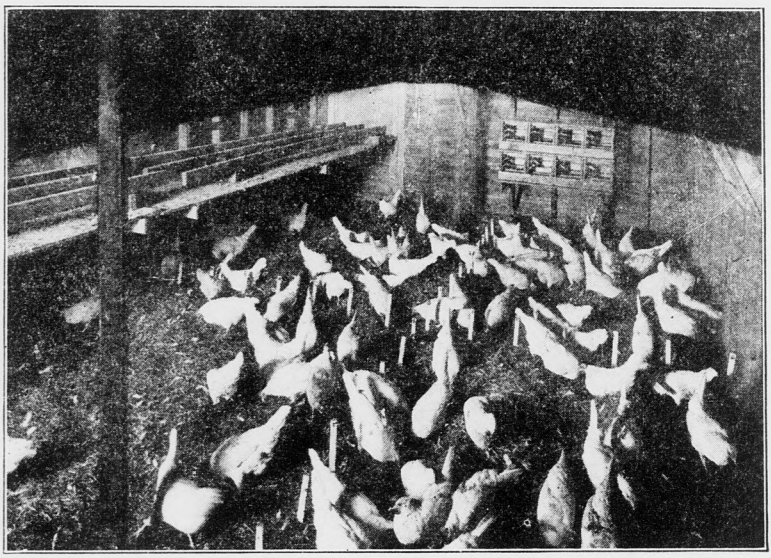

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1. Early sexual maturity. White Leghorns should commence laying at about 160 days of age and the general-purpose varieties at about 180 days of age.

2. Pullets of all varieties should lay at an average rate of about 50 per cent or about 15 eggs per month, on the average.

3. There should be little or no broodiness. White Leghorns usually do not exhibit much broodiness but general-purpose varieties must be bred for non-broodiness or there will be numerous interruptions in laying.

4. Pullets of all varieties should continue to lay for a period of approximately ten months from the time they start laying.

If most of the laying stocks of the country possessed these four characteristics, the average egg production of the flocks in the different states would be considerably higher than 110, which is the average egg production in Maryland.

White Leghorns have been bred for high egg production to a greater extent han general-purpose breeds. White Leghorn laying pullets usually exhibit much less broodiness than general-purpose laying pullets. Because of their smaller body size White Leghorn laying stock is usually able to produce eggs more efficiently than general-purpose laying stock. On the other hand, White Leghorn hens marketed after the laying season is over command lower prices than general-purpose hens.

In addition to the number of eggs laid, their size is important in influencing the income obtained from the flock. Small eggs usually have to be sold at a discount. In order that pullets may lay eggs of reasonably good size, especially when laying commences, White Leghorns should weigh at least 3½ pounds and general-purpose varieties should weigh about 5½ pounds when they start to lay.

## Overcrowding Laying House Dangerous

Putting too many birds in the laying house is false economy because overcrowding usually gives rise to one or more of the following conditions:

1. Each hen's chances of getting plenty to eat are reduced.
2. The litter is apt to become damp very soon.
3. Feather picking and cannibalism are apt to beome serious.
4. The spread of disease is liable to cause excessive mortality.

Allow 3½ square feet per bird for Leghorns and 4 square feet per bird for general purpose birds.

## Securing Chicks from Hatcheries With U. S. Pullorum-Passed and Pullorum-Clean Ratings

Several flocks and some hatchery operators all of whose flocks have no reactors at the last pullorum test made within the testing year preceding the sale of chicks qualify as U. S. Pullorum-Passed flocks and hatcheries, respectively. Flocks and hatcheries all of whose flocks pass two consecutive pullorum tests not less than six months apart qualify as U. S. Pullorum-Clean flocks and hatcheries, respectively. The number of U S. Pullorum-Passed and Pullorum-Clean flocks and hatcheries in Maryland is on the increase.

# Regular Culling Necessary to Maintain Profitable Production

By Morley A. Jull, *University of Maryland*

CULLING should be practiced every month in the year. This is very necessary in order to maintain the flock on an efficient system of production. throughout the year. By following this system poor layers are culled from the flock as soon as they are detected. The major share of the culling of the pullet flock should be done, however, in July or August. At this time the entire flock should be culled thoroughly, the size of the flock being reduced materially to make room for the new crop of pullets. If the simple leg banding system that is outlined below is put into practice at the different times the flock is culled, the birds left at the end of the year will consist of the following:

1. Those with red leg bands for early sexual maturity.
2. Those with white leg bands for good rate of laying.
3. Those with blue leg bands for persistent layers.

Birds possessing these three characteristics should be kept for breeding purposes. How many birds of this kind will be left at the end of the first-laying year in any flock depends upon how rigidly the flock has been culled during the laying year and the amount of mortality.

Since yearling hens begin their second-laying year relatively much later in the year than they began their first-laying year, they are culled later in their second-laying year than in their first-laying year. Yearling hens in the flock should be culled from month to month, of course, the same as pullets but the major share of the culling of the yearlings usually should be done during September, October, and November. The same factors apply in culling yearlings as in culling pullets.

Most farm flocks are comprised of about 75 per cent pullets and about 25 per cent yearlings. By the end of their second-laying year practically all of the yearlings should have been culled because birds in their third-laying year usually do not lay over 75 per cent of their second-year production.

Among flocks comprised of hens and pullets entered in the Connecticut home egg-laying contest for 1939-1940, about 50 per cent of the birds were culled and there was about 10 per cent mortality, so that 39 per cent of the flock housed was left at the end of the contest. Among flocks entered in the Maryland farm egg record project for 1939-1940, about 39 per cent was culled and about 14 per cent died, leaving about 47 per cent at the end of the year. Among flocks entered in the Nebraska poultry cost account project for 1939-1940, about 46 per cent of the birds were culled and about 16 per cent died, leaving about 38 per cent at the end of the year.

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PIK - REM—Blood Soluble Anti-Pick

VERMEX TABLETS—Worm Tablets

OVUMIX—"Double - Duty" Tonic and Wormer—a flock treatment

TRA - MIN— A Blend of Trace Minerals Consisting of Iodine, Manganese, Copper and Iron

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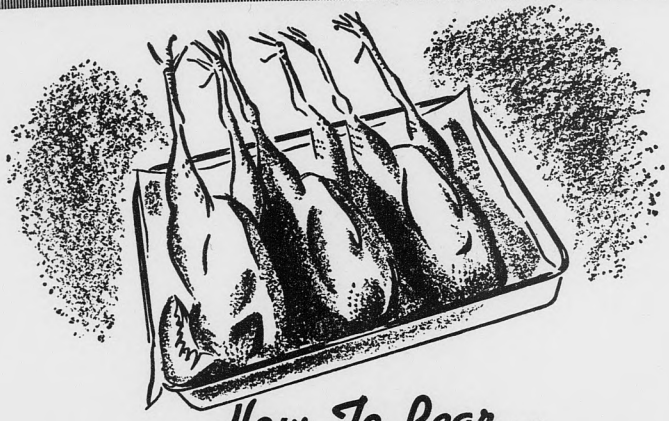

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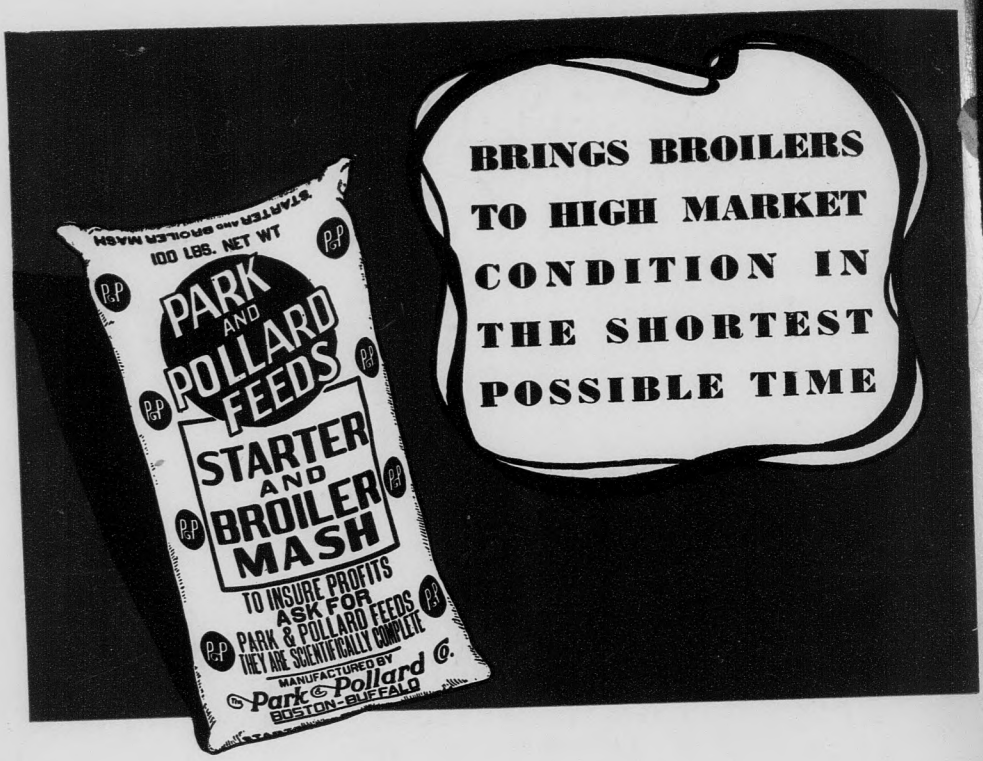


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